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AUTHOR Gibson, Chere Campbell, Comp.
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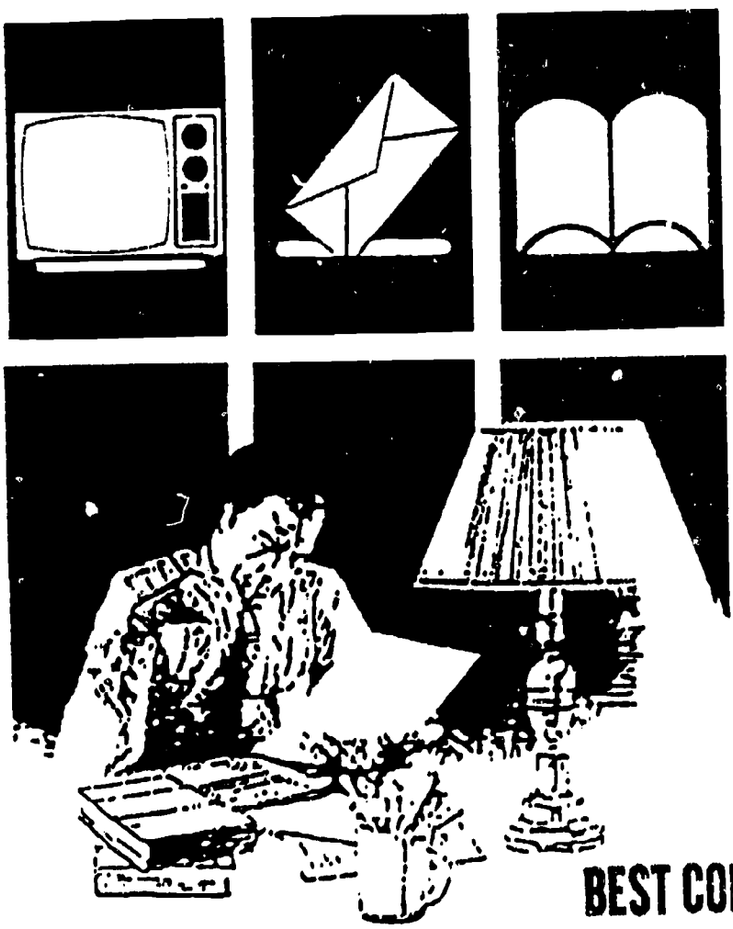
ABSTRACT

Presentations at this conference focused on future developments in distance education and innovative uses of learning technologies. Ten papers from the general sessions, including keynote addresses and a panel, are presented in the first of two sections. Topics covered include planning for new priorities in distance education; trends for the 1990s; strategic planning for new priorities; new learning needs and educational roles; responding to new realities in higher and K-12 education, education/industry partnerships, and business and industry role; and meeting the challenge with creative vision and action. Topics addressed by the 27 seminar papers in the second section include using distance education to reach out to underserved adult populations; live and interactive instruction; assessing effectiveness of interactive learning systems; the changing infrastructure; equality of educational opportunity; communications satellites; improving teacher/tutor performance in literacy and basic education; computer networks; effects of delivery systems on educational outcomes; the role of television in distance education; training distance educators; cross-cultural distance teaching; teleconferencing to meet individual needs; instructional design; assessing and supporting distance education courses; computer-based learning systems; and strategies for designing teleclassroom training programs. Most of the papers provide their own bibliographies. (DB)

Sixth Annual Conference on Distance Teaching and Learning

Echoes from the Future: Challenges for New Learning Systems

Madison, Wisconsin
August 8-10, 1990



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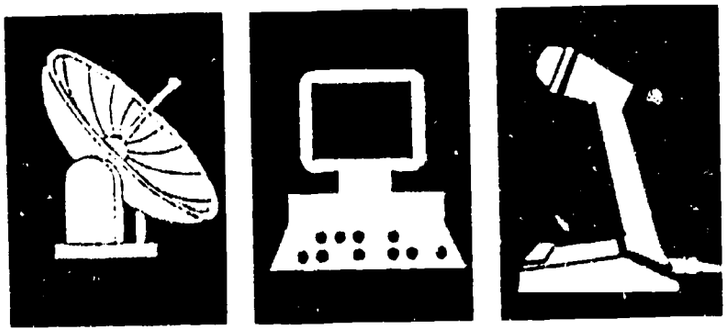

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Sixth Annual Conference on Distance Teaching and Learning

Echoes from the Future:
Challenges for New Learning Systems

August 8-10, 1990

Welcome! Whether you were with us at the 6th Annual Conference or are now exploring the conference through the written word, we're glad you joined us. In my opening comments to the more than 350 conference participants in Madison, I noted my fondness for the Brazilian educator Paulo Friere, an educator for social change. In his writings, he emphasizes the importance of praxis - reflection and action. As practitioners, we find ourselves doing a lot of scurrying around designing, delivering, and evaluating educational programs and training efforts. We are doers and we find ourselves in an action mode. Conferences provide a respite, in some ways, from that action mode. They provide an opportunity to question the actions of yesterday and today and to carefully consider the actions of tomorrow. Time for reflection is often badly needed time.

Our is an important enterprise: we touch the lives of many people. We touch their lives in the roles of parents, in their roles as workers, in their roles as citizens. We have a responsibility to lead with carefully considered steps. Many attend conferences (and read the resulting proceedings) so they can become better actors. Let's also reflect so we can become better leaders. We hope both the conference and the proceedings facilitate both reflection and action as we explore "Echoes from the Future - Challenges for New Learning Systems."

Chere Campbell Gibson
Conference Chair
University of Wisconsin-Madison

Sixth Annual Conference on Distance Teaching and Learning
Echoes from the Future:
Challenges for New Learning Systems

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KEYNOTES AND GENERAL SESSIONS

Opening Address

ECHOES FROM THE FUTURE--LISTENING FOR THE MESSAGES

Jerold Apps
Department of Continuing and Vocational Education
University of Wisconsin-Madison

Thank you very much, Chere. It is a pleasure to be here. At one of our committee meetings planning for this conference, we sat around the table thinking about a theme--that is always a problem for a planning committee. We knew the conference should look to the future. We also agreed it ought to be issue oriented, practical and down to earth. But this time we wanted the conference to be provocative and mind stretching as well. And after some fits and starts, we came up with the theme, "Echoes from the Future." More than one member from the committee was concerned that people wouldn't understand what it meant. They were concerned that some people might even choose not to come with such a vague theme. So as a compromise the words "Challenges for New Learning Systems," were added to the theme. A few weeks after we had agreed on this theme, I got a phone call saying, "You know I am afraid, Jerry, that people are not going to understand what that theme is all about. Maybe you should say a few words at the beginning of the conference explaining it." That is why I am here.

When I was a boy, growing up on a farm near Wild Rose, in central Wisconsin, I used to climb up to the top of a hill back of our barn and yell for my friend, who lived on a neighboring farm half a mile or so away. On clear, quiet nights, particularly in the summer when the sun was setting and the mists were rising from the valleys, I'd yell, "Hello Jim," and I would hear my echo rolling over the hillsides and tumbling through the hollows, "Hello, hello, hello, Jim, Jim, Jim." All of us right now are hearing echoes, but echoes from the future. Echoes that are rolling over the hillsides and tumbling through the valleys. Some of the echoes are a bit muffled and unclear. Others are sharp, precise and leave little doubt as to what they mean. So I want to say a word or two about these echoes from my perspective.

First, let's address the unmistakable echoes, the echoes that we all hear. There are echoes of gunfire in the Middle East. Those of you who heard the eight o'clock presidential address know what I am talking about. Those of us who have followed the news, how could we have avoided it, know of the echoes about the environment, echoes about the homeless, echoes about a global community, echoes about North America's place in world economic competition, echoes about an aging population, echoes about literacy in the work place and everywhere else, echoes about making cultural diversity work, echoes about information technology--the focus of this conference. These are some of the

echoes that for most of us are quite clear. We don't have to listen carefully to hear them.

But there are other echoes that are less clear. I call them whispers. And we need to listen--now more than ever--for the whispers. We must listen to the echoes that are not yet loud and clear, not yet agreed upon, those tiny little echoes that we only hear on certain days when the weather is just right and the wind isn't blowing.

Let me give you some examples of some of the whispers that I hear. These whispers, I believe, will become echoes in the near future. First, participation in our democracy seems to be waning. The July issue of Harper's Magazine, reported that one-third of this country's citizens toss their census forms in the wastebasket without even looking at them. Two-thirds of the people in this country don't vote. Heated debates about national issues are less frequent. As a people we tend to ignore what is going on around us. I hear a second whisper--the problems caused by the solutions to previous problems. Peter Druker wrote recently, "Some of the toughest problems we face are those created by the successes of the past, successes of the welfare state, successes of the knowledge society." With all the advances in information technology--ways of storing, finding and distributing information--we have created a host of new problems; problems that probably all of you are concerned about.

Richard Wurman wrote an interesting book entitled Information Anxiety. He writes, "Information anxiety is produced by the ever-widening gap between what we understand and what we think we should understand." It's the black hole between data and knowledge. It happens when information doesn't tell us what we want or need to know. According to Wurman, information anxiety results when we do not understand information, we don't know if certain information exists, when we don't know where to find information or we don't know how to get at the information we want.

Further information anxiety occurs when we have too many choices, too much information, and we don't know which information is appropriate to our situation. For many of us, the vast amount of information that we are subjected to creates this anxiety daily. Information anxiety also occurs when we can't distinguish accurate information from inaccurate. I could go on with that but let me go to another whisper--the need to examine the assumptions that drive our society.

One of those assumptions is specialization: As we become more specialized, we will become a better society. I'm not so sure this is true. A noted geographer contends that as we specialize we become more individual. He writes, "In the west, the self has grown apart from others in prideful and nervous sufficiency. We

are islands, each a world of its own."

Another assumption that we need to examine is that of efficiency. Tight budgets often necessitate doing more with less. But what happens when we always correlate dollars with results, particularly in the business of education?

An assumption that drives our society seems to be changing for the better. Stanley Davis, author of Future Perfect, argues that after thirty or forty years, in a new post-industrial economy, we still mistakenly follow the assumptions of an industrial model. This model is based on production, consumption and distribution. He says that we must focus ever more on that which is beyond those factors. We need to focus on that which is added on--the additional factors, the intangible services that make a difference.

Finally, another whisper that I hear is the realization that multiple transformations are likely necessary before we can move forward. We must set aside old assumptions, old ways of thinking and old strategies for change. We must challenge the traditional approaches for adapting to change. We tend to wait for change to occur and then try to adapt. As leaders, we must take a more proactive stance. We must help people build their own futures rather than help them adapt to somebody else's future. Those of us who educate, most of the people in this room, have fallen down on that responsibility.

One more whisper I hear: many current ideas about teaching and learning are outdated. We must examine the fundamental meaning of what teaching means and what learning is, particularly as it is influenced by technology. We must reexamine old theories and old practices. For instance, we need to reevaluate the course, that fundamental way that instruction is so often organized, both in credit and noncredit situations. Recently I read this in a national report: "For many part-time learners, each course can become a singular disconnected learning experience. For these students it may be necessary to reevaluate the utility of the course as the basic unit of instruction." In other words, we need to know more than what teaching and learning means. We also must examine how we organize teaching and learning, setting aside old assumptions.

We are on a quest, it seems, to make learning more efficient, to provide people with increasing amounts of information. But we forget one terribly important feature of learning. We all need stopping out time in our learning. We need time to clear the mind, to reflect on what it is we are trying to learn. We need this downtime away from the barrage of information that attacks us all. Yet in our quest to be more efficient we overlook the importance of clearing the mind--the importance of reflection.

As you participate in the conference this week, I hope you will listen for the echoes from the future. Several of our speakers will address in more detail the import of these echoes. I hope that you will arrive at ways of dealing with these echoes from your own perspectives. And as you listen to the echoes, I hope you will also listen carefully for the whispers; the whispers that are not clear, that are not agreed upon, that are not evident. Are you listening? Thank you very much.

Challenges Keynote:

AN OWNER'S GUIDE TO THE FUTURE
KEY TRENDS FOR THE 1990s

David Zach
Futurist, Innovative Futures

Who would you think from the 1980s set the tone for the 1990s? Individuals who have really set the stage--any suggestions? (Names called out from audience.) Okay, those are the futurists. Any other names? Madonna, that's a good one. Anybody else? Reagan, Gorbachev. Okay, my suggestion is Vanna White. Vanna once said, "My job is not all that difficult but I do have to know the entire alphabet." Now something tells me that this is not what educators have in mind when they discuss distance education. Some other highlights from the 1980s:

--Microchips now outnumber people. In the late 1960s microchips didn't exist, now there are more of them than there are of us!

--McDonald's employs more people than does General Motors. We used to be known as the nation that built all the automobiles, now we're known as the nation that flips the hamburgers. What happened?

--Relatively uneducated people like Steven Jobs and Steve Walsniak started Apple Computers. Bill Gates heads Microsoft Software. They dropped out of college. By our traditional standards, they are educational failures. But Bill Gates is a multibillionaire and the three of them combined have gone on without the educational system to completely transform the system.

--There is a problem with our high school graduates. About 18 percent of last year's graduates could not read their own diplomas and that doesn't include the many who dropped out. Chere mentioned information anxiety, a concept from Richard Wurman's book by the same name. That book proposes that a typical daily edition of the New York Times contains more information than a person living in the seventeenth centu.y would have encountered during an entire lifetime. We're drowning in information and starved for knowledge. In the 1980s millions of people throughout the world were first able to say "I am free." We created democracy. There are millions of people in this country who cannot spell democracy. If you don't understand it, it will not work.

--If you want to know what's on people's minds, look at the books they're reading. That will tell you what's important to them. You should know that Is Elvis Alive? occupied the New York Times Best Seller List of Paperbacks for five weeks. Here's a frightening thought: many of the people who bought the book also have the right to vote!

Now let's take a guided tour of the future, but first I want to mention that I'm not involved with distance education the way you are. You folks are the experts. This is not a program about the future of distance education, it is a program about the future in which that notion of distance education will exist. It's a sense of context. You have to take the forecast, the ideas that you hear today, and reflect upon how that forecast fits in with your work. You're the ones who must make the difference.

We've all heard about the age of information, the flood of information, the information explosion. We have to put this into practical terms. If you take a child born today, by the time that child is fifty years old, it is estimated that about 97 percent of all human knowledge will have been discovered since that child was born. Put another way: if in the year 2040 you were to take all human knowledge and condense it into 100 volumes, only three of those volumes will have been written before today. Have you read any good books lately? Mark Twain once said, "Those who do not read good books have no advantage over those who cannot." Rule number one of the information age is go after the information.

But what kind of information should we pursue? We're being flooded with information--is it all relevant? Maybe it's not an information explosion, but instead a noise explosion. One of the biggest challenges in trying to get information across to people is creating an elegant message: a message that is concise, precise, intriguing, articulate and convincing. This message is influential, and it is valuable to the person consuming that message, because there is a tremendous amount of competition for your particular message. For every one person you reach through your efforts at distance education, there probably are ten more who are getting their education from people like Vanna White. How do you challenge that? How do you market against it?

There are four key skills needed to deliver the elegant message:

1. You must learn continually. In the face of all that information, education does not end, it's a lifelong process.

2. You must adapt to change. It has been said that change is like a steamroller: If you are not on the steamroller, you have a good chance of becoming part of the road.

3. You must solve problems.

4. Most important, you must communicate, which goes beyond simply writing and speaking. It involves listening, observing, analyzing and synthesizing. It's knowing where to go to get the information and then knowing what to do with it. Think in terms of what we call the 80/20 Law. Because of computers, automation and flexibility of job choice, about 80 percent of what you do can either be done by a machine or by somebody else. Ask yourself these questions. What can you do that cannot be automated? If you can think of something, and if it's legal to sell, I think I'll pay you at a level to which you've grown accustomed. Ask yourself what you want to do. All you have is 20 percent to really work on and develop. That's the essence of what's going to make you employable and vitally involved with the long-term future. Think in terms of the word vocation. It comes from the Latin root vocare. It means a calling--what's your calling for the future?

Another trend is the shift toward interpersonal computers. Here's the background. The 1970s could be called the decade of the impersonal computer. How many of you saw the movie 2001: A Space Odyssey? Most of you. Remember that scene where Dave Bowman says, "Open the podbay doors please Hal." Hal says, "I'm sorry Dave, I'm afraid I can't do that." Hal took over the ship, killed two of the astronauts, and tried to kill Dave Bowman, forcing him to shut that computer down because it was dangerous! In that decade we kept our computers shut off in their own rooms. We let engineers and accountants play with them, but few others.

Then came the 1980s, the decade of the personal computer. We saw how we could use those computers on

the job, in the home and in the schools. It was frustrating, but at least we became aware that there were things we could not do without the help of computers. Now the 1990s usher in the decade of the interpersonal computer. Computers will be used increasingly as tools for communication, expression and creativity. The majority of people using computers in this decade will not be number crunchers. They will be communicators. Consider some qualities of the interpersonal computer. It's transparent. The technology for an interpersonal computer is not obvious. You don't have to think like a computer to use it. It's portable. By this I mean that you're going to use it wherever you need to be to do your job. If you are conducting underwater research you can take that computer down in the water.

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Middle-class families will protect their children from whiskey or the consequences of their actions. This points out that there are at least two kinds of poverty in the world--economic and spiritual. Both are preventing us from moving into the future that we want, and the future that children deserve. The average 12-year-old in the United States will witness 11,000 murders on television. That is not the proper use of that medium. The Weekly Reader did a survey and found that 30 percent of 9-year-olds feel peer pressure to drink. We pay our garbage collectors and our parking lot attendants more than we pay our college educated day-care workers. It's a question of priorities.

I do not tell you these things to disappoint or to discourage you, but because those are the challenges that we will face as we move toward shaping the future. We must recognize that the future is not a gift, it is a charge. We must also recognize that children are a message we send to the future. What is the message?

So I leave you with one final quote, from a French theologian. "The future is in the hands of those who can give tomorrow's generation valid reasons to live and hope." Let that be a challenge to you. In your work, in your life, in your relationships, what are the reasons to live and hope? Find those, build upon them and create a better future. Ladies and gentlemen, welcome to the challenges of the future. Thank you.

Implications Keynote:

STRATEGIC PLANNING FOR NEW PRIORITIES IN DISTANCE EDUCATION AND TRAINING

Robert DeSio
Vice President of Long Range Planning
National Technological University

Thank you very much. I was chatting out in the hall about how this is a great opportunity to wear my IBM uniform. I have one black suit left. I'm retired, and on occasion it feels good to wear this uniform, sit back and reflect on the IBM Corporation. It is a very important part of my life. I joined in the early days of computing when the most automated instrument I had was a slide rule--when IBM's business was mostly typewriters. I have been fortunate to experience the history from a corporate viewpoint all the way through to the computer age.

I just finished reading a book by Tom Watson, Jr., which I recommend to you. He was the son of the founder of the IBM Corporation. It is about a father and son and gives a unique insider's perspective about IBM. It discusses some of the things I was subject to--the uniform, the detached collars, the white clothes, the no-drinking policy. Bands played during lunch time at the laboratories and the plant. I never quite understood those policies. The son of the founder challenges some of his father's initiatives. But when I think back to the 1980s and the competition with Japan, I appreciate what IBM did for me in those days: the loyalty, the nationalistic feeling that I had--even singing songs. It was something that passed us by that the Japanese picked up on in the international competitive arena. The thing we need in corporate America is not quite that extreme but something similar. It is a loyalty that transcends the company. It was good for the country.

The no-drinking policy really interested me. I had heard terrible rumors: that you could not drink at IBM and that they had spies who scrutinized your social life. I never understood the genesis of the no-drinking policy. The son of the founder explains it. In the early 1930s, late 1920s, his father worked for the National Cash Register (NCR) company, and Patterson, the head of the NCR in those days, was one of the great trainers. He developed some of the key executives in this country. Mr. Watson, Sr., was a young man without a college education, who came from

Horseheads, New York. He went to work for NCR in the western part of the state of New York. He sold cash registers and weighing machines and things like that. He became excited because he sold his month's quota in one day. So he borrowed his boss's horse and buggy. He delivered the goods, and in that excited state he went into a saloon. He got drunk and when he got out the horse and buggy had been stolen. And he was promptly fired by his boss. Therefore, when IBM was set up they initiated a no-drinking policy. That was the origin. I never quite understood it. I think they drink at IBM today, a little bit as long as it is not during regular business hours.

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I am going to speak generally. I am not going to give you solutions. But I am going to give you some perspectives.

I feel blessed and fortunate in having worked in the private sector for a number of years. I saw education through the eyes of a company struggling in the international arena--competition on a worldwide basis. I managed technical education for the company for a number of years: built a minicampus, a $60 million campus with dormitories, state of the art in every sense of the phrase with a satellite delivery system that went to twenty-three IBM laboratories and plants. Then in the dying years--my last two years at IBM--I was in a position to give money on behalf of the company. (I am a lot younger than I look, but seven children played havoc with me.) We gave approximately $100 million a year to education in this country. It gave me a chance to see the university community and community colleges in a different way. When I left IBM I went to work for the National Technological University. I refused to move; I live in Saratoga Springs, New York, where they have a track, music--all the excitement that one looks for in retirement. But through the marvels of technology (I have a fax machine and PC with a modem), I am in business without having to be physically present. I have been lucky and it is an exciting time for me.

I am going to say something about second careers because I think one of those hidden advantages that we can capitalize on are those individuals who want to pursue second careers in training and education. They don't have to worry about tenure or any of those things that are sacred to the universities. They have already got their pensions, they will be tremendous assets--

especially in those areas of shortage in this country.

I want to talk a little about technology. If you go to Third Avenue in New York City early in the morning you will see an individual struggling down the street. He will go into a building that has many stories. It is an old loft. He will go up the stairs and into a room in the midst of the noise of lower Manhattan. He'll go into a room as clean as a hospital; it looks like a semiconductor laboratory that could be in East Fishkill, New York, or Motorola. Mechanisms whir and lights flash--a complexity of mechanisms and robots. This individual will go over to a table to open up a bolt of cloth. Then a cantilevered complex mechanism will come down, and he will manipulate it. He will bring down a set of cross hairs. He will identify all the imperfections in that cloth. He will press a button marking the spot, and it will be recorded geometrically into the complex mechanisms and memory of that system. He will do that through the whole bolt. Then he will take his first order, which requests a mens 42 suit, regular. The mechanism will remember the coordinates, the geometry of that bolt of cloth--locations of imperfections. Then with an eye toward optimization and minimizing the waste in that bolt of cloth, a laser beam will cut out the pattern necessary for a mens 42 suit, regular. That man, at the end of a long day, will go down the stairs, back to Third Avenue and walk back toward his home or apartment. Along the way he will run into someone who will ask, "What do you do for a living?" His answer is, "I'm a tailor."

Now I would suggest to you that all of our jobs have been similarly impacted by technology. That man is a tailor in every sense of the word, but the job of a tailor is now manifestly different than when he went into the profession many years ago. And I would suggest to you, especially those of you in education, that your job is very different than in the days when you started in your profession. Over the past five to fifteen years similar changes have occurred in industry, engineering, business, administration and financial areas. Managing business in this whole technology, which impacts and affects us all, is fundamentally different. We don't have the proper disciplines today: the traditional MBA programs do not prepare adequately for managing those technological processes. The point is that technology has played a key role. We heard that certainly when we discussed what is going to happen in the 1990s and up through the year 2000. When one reflects upon the impact of technology, there are at least two components that have

a dramatic impact on our civilization: computer technology and communications technology. Because those two areas have had the greatest impact on us as human beings, whether it is from an educational or a business point of view, the world's physical dimensions have not changed for thousands, millions, of years. But the logical world has changed dramatically in that nothing is more than a microsecond away, and through the marvels of technology, of transportation, we can physically reach any part of the world we desire. In the logical world we touch Africa, we touch the USSR, we touch Japan. They are as close to us as Chicago or a suburb of Madison--that is what technology has wrought. So it has made a great impact.

Consider the history of computer technology. When I came into the business, in the day of the slide rule, we measured down to the millisecond. We went to microseconds. We went to nanoseconds, we went to picoseconds, which is a trillionth of a second. I had difficulty comprehending that. A picosecond is to a second, what a second is to 31,700 years. That is the kind of speed we are talking about with current technology and information systems. And that is the kind of potential that the architects, those who design--whether it be for educational systems or something else for all of us--are working with. The greatest, most profound impact of this technology is a knowledge explosion. We read ad nauseam about that and the various implications.

It was also mentioned that we are becoming a very specialized country. One of the terrible effects of specialization is that we lose our general practitioner capabilities. I refer to engineering and science. One of the great horrors of the country is that people entering business from an engineering school become overly specialized and lose that general practitioner knowledge base, which means their value to the company and the country decreases--their degrees of freedom. They are generalists in every sense of the word, they can be true, honest entrepreneurs, but they are constrained. I recognize the need for specialization, but in the process we must maintain our general practitioner capabilities.

The scientists, engineers and technologists can build anything we want. The challenge then becomes, especially for educators, do you make things happen, do you dictate what you want, or do you let them force it on to you? First and foremost, we must take hold of science and engineering technology and build what we

want. There is a continuum of possibilities and opportunities in education and other areas. You must get into the driver's seat and dictate what you need to help you in this challenging job of education--to help you educate. You will expand the technologies whether it be in transportation, communications--the whole area of educational technologies. We must move forward. During this shortage of qualified faculty at all levels, kindergarten through higher and continuing education, it is necessary to focus on educational productivity. We talk about productivity in manufacturing and everything else, but we don't say much about productivity in the education process, which must go hand and hand with quality. The use of educational technologies--especially distance learning technologies--has to be a tremendous amplifier and a tremendous productivity mechanism for us. We must focus on how we are going to use the technologies in the education process, not as a replacement for, but as an amplifier to address the productivity problem of this country. And so the key challenge that we have as educators is: are we going to be enablers or disenablers? An enabler takes advantage, without fear, of technology.

We have always feared technology. As a result we have been poor forecasters of the future. I suspect that the future we predict here will change next year when we take another look at that future. Here are a few illustrative cases. Lee De Forest invented the vacuum tube in 1926. In a sense, he was the forerunner of radio, television and computers. Here is a quote from Lee De Forest in 1926 about the vacuum tube and its applicability to a prototype black-and-white television set. "While theoretically and technically television may be feasible, commercially and financially, I consider it an impossibility, a development of which we need waste little time dreaming."

That was the person who started it all. Then the transistor was invented at Bell laboratories. In 1948, on page ten of the New York Times, in the section near the radio listings for the day, there was a quote, "The transistor might have some significance to the communications industry." Now they could have placed that near the obituaries, but at least they had that much insight.

If you study the legends of St. Thomas and Albertus Magnus, the great teacher/philosopher and his teacher, even in their time, the idea of robots--automation and technology--struck fear. St. Thomas went to the great

teacher's door, and the teacher had built a robot that would answer the door and ask visitors to identify themselves and state their business. St. Thomas, when he approached and that robot confronted him, he said in deep fear, "This is terrible, it is bad," and destroyed the robot with his staff.

The Jacquard loom was invented in France in 1801 and by 1812 there were 14,000 Jacquard automatic weaving machines. If you have seen any of those machines you'll know they are a complex and sensitive mechanism. The workers in those days were so overcome with fear of this new device, of what technology had done, that they threw their shoes at it to destroy the mechanism. That is the etymology of our word sabotage.

Let's look ahead now to some of the great forecasters, Mr. Tom Watson, Jr., the second chief executive, son of the founder of IBM Corporation. During the early days of the Korean War the corporation wanted to help in the war effort. Watson, Jr., decided to build a supercomputer. (A supercomputer in those days would fill this room, but the power was no greater than that of your kid's PC.) He said we are going to build twelve of these systems, and this power, capability, and capacity will fulfill the needs of the world.

What a horrible, terrible forecast. Instead of the twelve supercomputers he envisioned to satisfy the world's needs, the IBM Corporation built over 2,000 of those computers. That is what launched IBM into the computer era.

So in this era of technology and the challenges of technology, I urge you not to be disenablers, don't fear technology. Sort of get your arms around it, figure out how you can use technology in the education process. A great poet and philosopher said, "As for the future, don't worry about forecasting, your task is not to foresee but to enable, be an enabler." That is all I want to say about technology. It creates, as we have seen, a knowledge explosion. It surrounds us, don't fight it, don't fear it, don't be too worried about where we are going. Be a forecaster, but get your arms around it and use it as educators.

The second fundamental issue that we must address after knowledge and technology, is that the world is changing dramatically in every aspect--our politics and social structure. We are wrestling with globalization and isolationism, and we are witnessing cultural changes. We are seeing the demise of communism. We heard about

democracy this morning, it is mind boggling what surrounds us. We must not perceive challenges in terms of our community alone; we cannot think of our world as being Madison or Wisconsin or the United States. We have to be internationalists in our thinking. First and foremost in the process are the educators, you must think globally--as we all must. This is necessary outside the international competitive arena as well. I have seen companies that buffer their employees from available educational opportunities because it might create problems or pressures for those employees to take that training and education. Those opportunities might be in the vicinity, right in that area or plant or laboratory. I feel that corporations and this nation cannot progress if we don't feel responsible to educate the world for more than competitive reasons. You cannot legislate education--where it will come from and who should receive it. We all must actively participate in that area. We have the technology. The opportunities exist for delivering education at a distance, whether it is via satellite, microwave, delayed videotapes, PC, PC with video disks or audio graphics. The opportunities exist to go far beyond our individual local communities.

I would like to talk about education as it relates to individuals and organizations. There is a continuum that ranges from an accent on individual, personal aspects to a stress on those organizations and those structures where individuals operate--whether it is in a company, or government, the military or someplace else. Later, the accent is on the individual again during retirement years.

The simplistic model of education is that you get it K-12, primary, secondary, and if you are fortunate to go on to college, your two-year community college. The idea that it ends there is dead in the water. Today the education system starts with the individual and accompanies him or her through the formative years. Then the individual invariably joins an organization and that organization--whether it is a company or business or something else--assumes a weighty responsibility for the continuing development of that individual as an employee of that organization. Then that individual is ready for retirement--or with today's longevity of life a second career. So the process of continuing or continuous education, training or learning, goes on. It never ends.

The analog of this from the industrial manufacturing point of view is the product life cycle. You start a

product off in research and development, you manufacture it, you put it out on the market, you continue to service it, and then the product life ends. Now look at the human product--human beings in terms of the education process. Through each of these stages, the needs and the requirements are different. We have heard ad nauseam through the last few years about the half-life phenomenon. We have also heard much about the obsolescence factor, especially for those working in technical areas. But today, our view of the world includes complex concerns about different cultures that affect doing business around the world. There are different kinds of political systems, language barriers and so forth. Then we add to that ethics. The half-life phenomenon affects everybody in the world, and we can become obsolete in the way we address the needs of the world, needs that transcend business or government needs. Each of us can become obsolete in our own way, especially in the current international arena.

Now that leads up to the need for every human being to have a set of strategies, plans and goals to take him or her from cradle to grave. We all have a vested interest in that. All of us in education must play a key role in that process. So one of the great challenges for those that encourage and motivate human beings throughout their lifetimes is to find a way to encourage individuals to plan for their development throughout life, through the years of employment and during those retirement years or years of second careers.

Many of us spend much of our life working in organizations: government, industry, education. And those organizations play increasing roles in our careers and our own personal development to do the job. The responsibilities of corporate America, for example, have grown at an astronomical rate. The expenditures of American industry exceed the annual expenditures of all 3,600 colleges and universities of higher education in training and educating their employees. And that is a tremendous investment. We have seen that corporations and businesses are evolving in training and education. Their initial responsibilities were to train people to do the job at hand, but now that responsibility extends beyond that in preparing their people for the future and providing education; generic education, not for today but for five years down the road. The role of the corporation has matured and grown through the years.

The IBM Corporation, for example, had 3,600 people in

the technical areas alone working on graduate programs during regular working hours, taking courses at local universities or from distant sources of education using the marvels of the technology. The emerging strategies of corporate America include education and training. However, we want that education highly accessible, because in the work force the most precious ingredient is time, time away from the job, what can we do to minimize that? The various modes of distance education provide a solution, and corporate America is embracing distance education to minimize employee time away from the job. Recently training and education have become integral strategies of corporations and businesses to meet their corporate, financial and business goals. This is a tremendous change. It's accepted, training and education go on continuously and the corporations will provide it. Why do companies, such as IBM, build their own education facilities? We have seen this corporate university at work at Aetna, the Bell System Center, and the Motorola University.

Why do companies in corporate America build something that looks like it might properly be the domain of the university community? The reason is straightforward: international competition. The competition is stiffening, especially in technological areas. In the 1980s Japan became a contender. A unified Germany will certainly become a strong economic force. It becomes an international problem. Corporate America has traditionally done a poor job of communicating its needs to educators. It is a timing problem; they could not wait. So corporations set up their own minicampuses--elaborate educational facilities. They dedicated large portions of their own resources to education. And many of these companies, Hewlett-Packard, DEC, IBM, AT&T, have elaborate distance learning processes: microwave, satellite transmission, delayed videotape, PC video disk and others. They are leaders in how those technologies are used in the education process.

Something dramatic is taking place. It started with the engineering schools in this country. If there is one discipline where there has been an activist role taken in the area of distance education it has been in engineering, in continuing education and in graduate education--for people working in the private sector, government and other agencies. A number of schools going back to the 1960s have taken leadership roles starting with the Genesis program of the University of Florida. They deliver graduate courses via microwave to NASA contractors in the Orlando area. These

programs exist around the country: the University of Minnesota, Stanford University, the University of Maryland, Colorado State University. At these schools, engineering in particular took on an activist role in the use of delayed videotape and microwave delivery of courses in continuing education and courses toward degree programs. Lo and behold something exciting happened in the mid-1980s. I don't mean to single out NTU, it is just one example of many, but NTU brought together a number of those schools that were already providing continuing education to working professionals and managers and brought them together in a partnership. They then used satellite delivery, which created a national platform to deliver courses around the country. However distant the source might be, individual schools now had the opportunity to receive satellite transmissions. From my perspective, after leaving industry and hearing all the terrible accusations against higher education, this is an honest-to-God partnership between universities on the one hand--working together with a common set of goals--and business and government on the other. This partnership, which works for the good of the nation, is one of many examples of higher education using the technologies to work in concert to meet the needs of the country.

Now what does that mean to somebody in industry? If I am in a plant or a laboratory and there is not a local program that meets my career needs or the company's plans for me, I can access that program from any distance. I can bring it in from 3,000 miles away. Educationally, this means I can tap in to the best education from around the country--some of the top universities.

Some of the great sources of education in this country come from the private sector. Nobel prize laureates are coming from the private sector, in superconductivity for example. Believe it or not, the private sector wants to share their educational knowledge base with others. So this satellite network that I have described also includes courses, state-of-the-art seminars from the leaders of the world--whether in superconductivity or high-definition television--from government laboratories and industrial laboratories. We now have an infrastructure that links higher education with industry. Higher education, industrial laboratories, and government laboratories provide education to professionals, managers and people in education. There is a partnership with a national infrastructure that portends an international set of

corporations.

Now let's examine industry. In this country, the industrial sector is working together. Companies such as Hewlett-Packard and AT&T have banded together in the face of international competition to set up a semiconductor research corporation. Companies are working together to identify common requirements and sharing in the development of the necessary training and education, which will come from universities and other sources. So the partnership goes out to the private sector.

I would like to say something about small companies in that sense. We have an awful problem, how do we get education to those that need it in small businesses? There is at least one solution: aggregation. Small companies must set up their own local consortiums for distance education, whether via satellite or delayed tape or some other method. This is a real challenge because so much is done for the big companies. They have got the money and the means, but we in industry must be concerned about the small company.

Another changing dimension of corporate responsibility is training, preparing people for their future in the company. Now with people living longer, corporations are responsible for more training. They must prepare people for retirement or second careers; that is a whole new set of responsibilities.

I want to say a few words about globalism versus isolationism. I said at the beginning that we cannot afford to put our heads in the sand. We must become global teachers and educators. Look at what has happened in the Eastern Block and the USSR. Look at the reunification of Germany. They are upstaging us left and right while we hesitate. What are we going to do in the USSR? In Japan? We must determine what we want to do in an international sense. We have so many haves and have-nots in this world, in the Dominican Republic, in Africa. So many people need education of all kinds: languages, basic math, accounting. I don't know many solutions that will help fill the void except distance learning technologies. We must put on an international hat and get with it.

Things are progressing. In Europe there is a consortium called Europepace. They are sharing satellite delivery of training and education between industries. Europestep is another example. Some countries in Asia are getting involved in distance

education. So we can teach, but we can also learn from others. We do not have a corner on technology and knowledge.

But how do we get outside the confines of our national infrastructure? I am setting the stage--strategic planning for the future of distance education.

First and foremost, we must set up an international infrastructure for education. The technology is there. We have substructures throughout the world we can bring together. We must link some of the outstanding sources, schools and providers in this country. Secondly, leadership in this education process in the 1990s is going to have to come not only from those associated with formal education but from the private sector and government agencies as well. They are highly productive in exploiting technologies in the teaching process. They have a more businesslike approach evaluating training and education--its roles and objectives. But we must tap into that segment of education to play a leadership role on a worldwide basis. We must have continuing cooperation between educators in education and those in the private sector, not only in the development of the education but in delivery.

Next, we must recognize an absolute problem--we have scattered expertise. We have got to use those delivery systems that bring in that expertise, from no matter how far away.

I said at the beginning that we in education want to continue to capitalize on technology, we don't want to exploit it. We have to have open minds. Technology is not a substitute for educators. It is an assistance, it is there to help us. We can't afford to have a Jacquard-Loom mentality in terms of our open-mindedness to technology. There are gimmicks associated with education. The personal computer is a gimmick. Kids that don't seem to have too much ability, you give them a PC, and it turns them on, it excites them. In a short time they become experts, which becomes a mechanism for their own learning process. So I am not above using technology for the younger generation. It is a stimulus.

Statutes are on our list of concerns. Our state laws are constraints, in many cases, on distance education. It is sometimes difficult to bring education across the border of a state, so we have got to come up with laws and statutes that do not constrain or preclude

excellent education coming from an open-ended set of sources. Internationally, there are practical constraints as one crosses national boundaries. These are hardships we must overcome.

Another area for work is in funding educational technologies. Corporate America does a tremendous job in giving and providing to higher education, for example, in the subject areas. But corporate education must do more in the area of grants--in educational technologies and distance education. Companies should work together to launch grant programs, which are critically needed. In engineering, manufacturing, some of the leading-edge areas, the corporate sector is ahead and people can pursue second careers. As I said in the beginning, there is no concern about tenure or anything like that. They have their retirement pensions. Let me give an example. The IBM corporation provides a technical career academic program. If, when you reach retirement age, you are willing to teach at a technical university, IBM will retire you. For a two year-period they will pay you at a rate of 35 percent of your retirement benefits, and they will pay your moving and living expenses up to $15,000. Now, with longevity of life, people will be excited about teaching, not only in higher education, but some in community college, K-12, what have you. That is an excellent resource that we ought take advantage of.

The next item that I would like to address is the marketing of lifelong learning. We must sell and market education at all levels. This reminds me of an incident that happened a few years ago. I used to do the programs at MIT and Harvard, all those exciting places. But I think the most exciting day I ever spent was at LaGuardia Community College, a small school in Manhattan, which was preparing kids for two-year associate degrees. These were kids who had never left New York City. I had a rap session with some students, two black girls. I was close to tears. These two young girls had come to get two-year associate degrees and then go to work--never leave, you know that geography. Someone had convinced them that they ought to go up the river, 150 miles to Vassar College, for a special summer program. And they almost turned that down. They had a deep fear that they would not be able to compete with the kids from the western part of the state. But they decided to do it. When they arrived in Poughkeepsie, New York, they were descending from the train, they suddenly realized that they were no different from those other kids. They were struggling, they were all going to have to lean on each other.

This was a big unknown for everybody. For ten weeks they went through that. These two young ladies returned to LaGuardia Community College and their goals were different. They wanted to get four-year engineering degrees. One was accepted at New York University School of Engineering, the other at Columbia University. Someone sold them the idea--try it, it is not above you, you are no different than other human beings. Now they are in the echelon where we have such tremendous shortages.

I bemoan the level of motivation in this country. My parents did not go beyond the eighth grade. My father was a barber. He raised seven children and put them all through college. I say that because my parents took pride in that. Our parents motivated us. They wanted us to become lawyers or doctors or enter another profession that was denied them. The stimulus was always there, and as we become affluent and receive higher degrees of education, it misses us. The current generation is not always motivated. We seem to do good things with the 10 percent brightest, most outstanding kids. We certainly focus on that 10 percent--and the kids who are in trouble. But I am more recently concerned with the 80 percent in the middle, where a little nudge would put them on a plateau looking for new experiences.

I was in South Korea about a year ago riding in a taxi. The driver asked where I was from. I told him the United States. He said, "Oh that is great. You know I am a cab driver, no education either. My one goal in life, I have one son and I am going to get him into MIT, and if he doesn't get into MIT I am going to send him to the University of California, Berkeley."

There is a stimulus there that we may be missing. I feel that we have got to market education at all levels. Not only to the young kids, to give them a feeling of hope, but also to those who are retiring. We must exploit the technologies.

Look at the opportunities. Capitalizing on all these educational technologies, it is like giving an artist an infinite number of colors, hues, shades and the ability to paint in two, three, or four dimensions, satisfying every creative instinct that might have remained dormant forever. It's like giving a composer or musician an infinite and never-ending source of notes, chords, and harmonics to blend them into beauty never experienced before. Or it is like giving an educator or a teacher the complete wisdom necessary to

stimulate, motivate, excite and transmit from an endless well of knowledge. That well is available to us today. But we must drive the system and not let the technologists drive us. Remember the beautiful tale of Alice in Wonderland. When they come to the crossroad the question arises of which road to take and the advice is, "Well if you don't know where you are going, it doesn't make much difference which road you take." So our challenge is to know where we want to go and take the right road. Thank you very much.

PANEL: NEW LEARNING NEEDS AND EDUCATIONAL ROLES

Panelist: Sally Johnstone, Director
Western Cooperative for Educational
Telecommunications, WICHE

Good morning. This is my first day of the conference. I was unable to hear the keynote speakers yesterday, but thanks to the wonderful futuristic technologies of magnetic particles lining up on strips of mylar, I was able to listen to David Zach on a tape this morning. It sounds as if it was a wonderful presentation. We were asked to think about some of the concepts that David Zach would present. I shared some of those concepts with my colleagues at the Western Interstate Commission for Higher Education, a group that has worked on policy in higher education for many years. We arrived at some insights based on notions that David Zach brought forward.

Mr. Zach talked about technology integrating itself into the educational structure and system. He spoke of changes as they would occur in the future. But the need for change is already upon us. Consider college board assessments of graduating high school students as a case in point. One of my colleagues pointed out that we still assess these students with blue books. I'm sure that those of you who routinely work with computers find it difficult to pick up a pencil to write an essay. I'm so used to switching words around on the keyboard. We're still assessing students using technologies to which they are not accustomed--paper and pencil. And college board assessments can be very important to a student's future. We haven't automated that process. This same colleague, a woman with a PhD in higher education, had been part of an assessment team for a college board. She took those tests and was scored as if she had been a high school student. One of the hardest things for her was writing with paper and pencil--and she didn't do well.

I'm sure everyone would more or less agree that the model in higher education institutions is, to put it simplistically, the self-contained campus. Faculty and departments are insular. They're not that interested in adopting materials or having outsiders tell them what to do. They have constructed their own realm of what is appropriate for their students to learn and consequently what is required to earn a degree. That may be breaking down in some interesting ways. As faculty members become increasingly specialized, there is a trend toward computer networks, to share

information with their colleagues around the country via electronic mail or bulletin boards. And that may have a profound impact on the way that the department and higher education structures operate within an institution, because faculty are beginning to rely on other faculty who are not part of their own departments--colleagues from other areas. They're expanding their view of the resources that are available to them from outside campuses. The erosion of parochialism could facilitate sharing more than just specific information--educators might also share a wider and larger range of resources.

We must keep an eye on how these computer systems and networks develop within higher education. The technology may become specialized for faculty use or it could become a decentralized, accessible learning resource. Faculty and administrators generally make these decisions, and it's not always the students' needs that come first. There is a wonderful opportunity to make these new resources accessible to students, but there's also the danger that these resources will be geared for faculty and administrators to the exclusion of students.

Mr. Zach's outline covered an area that was not as heavily stressed in his talk. I want to mention it because I think it's critical. How do we reach out and change the way we operate with other groups? The core curricula in all of our institutions of higher education are still based on European history. The changes in Europe are occurring at a rate faster than textbooks can keep up with. There is a demand and an eminent necessity for those of us in higher education to rely on means of communication beyond the textbook. We cannot provide our students with current information in a textbook, which takes about two years to develop. Textbooks in development right now will not be able to include information necessary to understand what's happening in Europe at the moment.

On the radio this morning I heard one of the schools in Northern Wisconsin is developing a curriculum or a major in Native American history. We are entering an age where we can't rely solely on a European point of view because our culture is quickly changing, as Mr. Zach pointed out, in terms of the work force, the background of the people that are coming into the work force and the background of those coming into our educational institutions. They don't want to be ignored. As different cultural groups become more dominant within our higher education system our

curricula must make accommodations. Technology can play a role, and is already playing a role, in interdisciplinary studies and courses that cross over departmental lines, particularly in sophisticated telecommunications-based courses. The telecourses that the Annenberg Corporation for Public Broadcasting has been developing, and the kinds of courses that the International University Consortium develops address more than one simple curriculum. Groups from different departments get together and address a single topic. I think it's been demanded because of the sophistication of the technology, but I hope that it will become a model for faculty working in more traditional settings.

There was one other point that I wanted to make tangential to how higher education fills in the gaps. Computers are our link to the world. Our offices and our ability to work and operate no longer need to be defined by four walls. One of my colleagues told me a story. A friend of his took this idea to its natural extreme. He found a little place to live in New Mexico, it was very nice, it had good phone access so he was able to set up his entire working operation in his home, and he very occasionally traveled to mee people, but he was no longer confined geographically to an office. A colleague asked him how his wife fit into the situation. The man replied that they were divorced last year. Without the office, without the outside interaction, there may have been a problem--too much isolation.

A great deal of my own work is done in ways for which I don't have to be physically present, but there's an awful lot of social activity involved in my office setting. If I had my way, I would stay at home or in some other place perhaps three days a week, but we must recognize that there are reasons why people want to get together, as evidenced by the approximately 300 people sitting here. All of us do a great deal of our work in isolation and interact through a variety of mediums, yet I don't think that our own population will become overly insulated. I'd like to stop at this point with those few thoughts and hope that other thoughts and comments will arise.

Panelist: Christopher Pipho
Director of State Relations
Education Commission of the States

I was interested in the book Terry held up, Inventing Education for the Future. About twenty years ago, I worked on a project called "Designing Education for the Future." We wrote a book examining the future, which for us was 1990. I believe we're suffering from a premature arrival of the future! We always knew that by 1990 we would see dramatic changes. But none of us were completely prepared. As you get older, at some point you realize that the future crept up on you. Your children or your colleagues bring it home to you. Suddenly the future is staring you in the face, and you haven't kept up with it--even though you viewed yourself as a futurist.

I used to teach a futuristic class to undergraduates, and I used Megatrends as a reverse textbook. I presented each one of his major points and assigned the students to write letters to Nesbith explaining how he missed the boat in just a mere eight years or so.

I'd like to tell a joke. I realize that jokes are generally used to keep an audience awake and alert, and every one of you is awake--I don't see a single nodder out there. I'm going to tell this joke only because many of you speak to audiences where you need a good joke, and a good joke can be hard to find! One of the points yesterday in the keynote address was about hyperliving and skimming over the surface of life. I must spend most of my life on panel discussions. Some of my closest friends are many states away. Terry Peterson, from South Carolina, used to be the Governor's aide on Education Reform. He showed up the other day in Columbus, Ohio. He was talking about hyperliving. He said, "I started out this morning, I was late and needed to get to the airport by 4:30 am. It was dark, I took a shortcut to the airport. I don't usually go that way, so as I spun around a corner I switched my headlights to high, and I saw a sign I'd never seen before. It read, Veterinarian/Taxidermist. I had my foot on the gas and went right by it. I couldn't believe what I saw. I swung around the block, came back and noticed some fine print at the bottom. I wanted to know what it said....I stopped, got out of the car and read Either Way You Get Your Dog Back."

That's skimming over the surface of life. Terry says that really happened, but I question it--does South Carolina really have Taxidermist/Veterinarians?

I have followed distance learning from a state policy perspective to see how it's catching on, and I think it's doing well, as witnessed by the number of people here at this meeting. Sally and I were involved in a three-day telecommunications effort from Denver this spring, and I was intrigued by the questions and the growing interest on the part of state policy makers, legislators, governors and others about this issue. I realized that there are three basic forces or groups concerned with distance education issues. This gathering belongs in one of those groups: the people and events that will thrust distance learning into the greater or universal acceptance within K-12 education are not at this meeting; the people and events that will impede its progress and send it off on a self-serving tangent are also not at this meeting; but the people at this meeting can, probably without realizing it and in the slightest of ways, tip the scales toward acceptance by state policy makers and governors.

Some of the smallest things you can do are the most effective--inviting a legislator to sit in on a briefing, for example. We have some of our most interesting sessions at the Education Commission of the States when we schedule something related to distance education. The doors are busted down. Most of the interest is from rural legislators. We're untangling ourselves from almost a decade of education reform activities. Starting with the Nation at Risk in 1983 we focused on teachers, we focused on learners, we want, as one legislator used to say to me, "We want those little buggers to work harder." We've sought higher academic standards, more math and science.

We have tracked high school graduation requirements at the Education Commission of the States. I just put out a new fifty-state survey on that subject last week, the pattern is an upward slope, more math and science, generally more units of requirements. Only in a few of the upper midwestern states where local controls rule do we let local districts make those decisions. For the most part, since 1983, we have operated under the top-down mandate. We've done things to teachers and for teachers. We've tried to promote higher academic standards. But in retrospect, we have not made a significant difference in the whole swim of things. SAT scores are just about where they were, though they've crept up a bit in a few of the southern states. Generally, all of the standards and test scores are

similar to those of eight to ten years ago. State policy makers now feel burdened with an outdated, entrenched bureaucracy. When you view it that way, there's a temptation to run for the bomb shelter and give up on making changes from a state policy perspective.

Where does distance learning come in? There's a pertinent issue brewing in New Jersey, New York, Connecticut, Nebraska and Oklahoma: tax revolt is back. We've had some fairly hefty tax increases, but this year we're going to see ballot issues in all of these states. This year the legislative increases, fiscal increases, have been averaging about 7-8 percent, we've even had a few at 24 percent, and even with those increases we're still not making progress, we're seeing a new round of school finance litigation. There are more court cases pending on state-funded school finance formulas than ever before. And productivity is the issue that comes up most often in the recently released Chub and Moe book. What are we getting for our money? We cannot put more and more into education and expect less and less. How are we going to achieve productivity?

Pearlman of the Hudson Institute recently came out with a paper that indicates the need for more technology--productivity will be the result. If productivity becomes the watchword, where does satellite distance education fit in? There are new learning standards and roles, we must make changes.

The Education Commission of the States is an unusual collection of state policy makers. Some of you work for a board of regents, some of you work in public school districts. But the common complaint is, "We had a board meeting last night and did we catch it!"

I would like to offer my board for examination. It's an interstate compact--375 members. Our organization exists because of state legislation, enacted in Wisconsin and all the other states except Montana. The legislation calls for seven people on our board of directors, always a governor, always two legislators, usually the Chairman of the House and the Chairman of the Senate Education Committee--except in Nebraska, where we only have a senate--and four other people appointed by the governor for his or her term of office. Those appointees come from a wide range of backgrounds, Sandra Feldman in New York, head of the AFT, down to elementary and secondary school teachers, local boards, boards of regents, college teachers, high

school principals--all of these people sit on the board on which I serve. Our chairman each year is a governor--the chairman for the coming year is Governor Gardener of Washington. His theme for the year is "Every Child Can Learn." That could be a bumper sticker. Everyone would agree to that statement, except when we get a practicing group of educators in a room, they say, "Well. wait a minute, we have a group over there we have to put in a special ed. class, we've got another group we really need to group somewhere else, I don't think they can learn."

Technology will force us to look at equity differently, view learning in a different way. Our last chairman was governor of New Mexico. I bring him up because he could not succeed himself as governor, he's now a college professor. He put through a report card system for K-12 education, but he also enacted the first report card system for higher education. Beginning next year, all higher education institutions in New Mexico will be required to report certain data, the percentage of full professors teaching undergraduate classes, for instance, and it will go downhill from there once that information is out--suddenly the fat's in the fire and many questions arise.

The bottom line relates to what I said earlier: the people who will thrust distance education into the future are not at this meeting, and the people who will impede it are not at this meeting but you who are at this meeting can make a difference. You must find state policy makers. You need to talk to them, demonstrate to them, show them what is happening, invite them to your sessions. Take notes at meetings. In your general work-a-day world, what are the successes? Have you told the rest of the policy makers about them? What has blocked your progress? I tell public school teachers not to send photocopied cards to their legislators--write them letters. Tell them, we've had seven faculty meetings on this issue this year and we still haven't solved the problem.

What are the roadblocks from your perspective? Are there arguments over teacher certification issues? Last year the courts in Kentucky declared their entire system of education unconstitutional, the code books were thrown out the window. They had to create a 920-page reform law enacted this past year. Kentucky changed its education system from top to bottom, and the only people who fought it were local boards because it included an antinepotism rule, which stated that no relative of a school board member--all the way down to

nieces, nephews, cousins, aunts and uncles--could work in the school district. The other contested issue was a provision that teachers could no longer have anything to do with the election of school board members. The only issues that were fought were those two--by the teachers and by the school board. This system was an entrenched bureaucracy out to protect its own hide. "If you really love us--policy makers--give us a salary raise and then we'll talk." We all fall prey to these attitudes at times, on days when we wish the rest of the world would change and make our jobs easier. The events of the last two to three days in the Persian Gulf and recent events in Eastern Europe demonstrate that the world won't stand still, and education is caught in the vortex. Distance learning may be the lever, you may be the grain of sand to tip the scale and help solve some of our problems.

Panelist: Jack Ruff
Director of Engineering
Honeywell Microswitch

I represent industry so it's interesting to come to a conference like this and look under education's tent. I'll present the industrial perspective and let you look under our tent. My opening comments will paint a picture of what's going on in American industry in general, then we'll move on to specifics about our case, a manufacturing company.

American manufacturing-based companies are in crisis. I'd like to refer you to Edward Demming's recent book, Out of the Crisis. If you want to understand American industry, get a copy of Dr. Demming's book. The very existence of mid-American manufacturing is threatened. The world-class competitors have targeted markets in America. They're threatening our products, our systems and our way of doing business. Recently Japanese executives stated that the game is already over, America has already lost the game in the factory "to a better system."

The model for an organization can be depicted as a pyramid. This is true in Japan, it's true in America. The American pyramid is made up of stick figures, a hierarchical structure with arms and legs and heads at the top and at the middle--but not at the bottom. The stick figures at the bottom of the organization have no heads. This model depicts a factory floor devoid of brains. The Japanese model also shows stick figures, but the figures have heads at every level--especially at the bottom. There is not a single American manufacturing company that hasn't felt the impact of these efficient competitors as they thrust their products out of world-class factories.

Training and skill-building cannot be isolated to the tops of our companies. In our engineering organizations, education and training are taking on a holistic theme, it's system-wide--our American factories are becoming training grounds. They're becoming school rooms. No longer can we isolate the factory floor through a hierarchical system. There is a renewed effort to redistribute the intellectual resources for designing and manufacturing products. These are the futuristic factories. The people who built the product become an integral part of a constant improvement process. We see the need for thinkers on the production line, workers with more than just motor functions for the manufacturing task.

Now to really know where I'm coming from, you need to understand the organization that I represent. I work for Honeywell, a fairly large company that you've probably heard about. We have an operation in Freeport, Illinois called Microswitch, which manufactures switches and sensors. What does Honeywell, and Microswitch in particular, have to do with distance learning? Some locations in our division are 800 miles apart. Our headquarters, as I've said, are in Freeport, Illinois. Some people have asked, "Where's Freeport, Illinois?" If you draw a line straight west from Chicago, it's two decades west of Chicago! It's a strong community of 26,000 with a solid work ethic, but distance is becoming a problem. We're revitalizing this part of our company--I'd like to touch on a few related themes.

The first is quality. You may have heard of the Malcom Baldridge Award. Industry is pursuing: concurrent engineering, just-in-time manufacturing, customer satisfaction, helping our customers control their world, automation, a self-directed work force, change and continual improvement. These sound like the needs of a learning company. How fast can we learn? The key to rapid change in manufacturing is flexible manufacturing. Our assessment for training and education last year indicated that the number one need was teaching people how to work together.

Our other training needs are quality college, statistical process control and design of experiments--and something we're borrowing from the Japanese called C-Deck, which is a problem-solving deck. Many companies are looking to the Japanese and to other companies within this country. At Catcam, just-in-time manufacturing and on the factory floor, our basic deficiencies are in elementary reading skills, writing and math. How does an operator take an instruction off a CRT screen when he or she can't read? Our company's strategy is to use the human resources organization. These people now manage the exploding training and education effort.

But those with the most experience in continuing education come out of our engineering organization. The engineering organization and our field-based organization are using distance learning techniques, including satellite delivered education, so we're joining forces between various departments within the company. The audience is expanding rapidly, there's an

urgency to network with more people, to work together in teams--travel budgets are becoming a major problem. If you require five or ten people to work together from three locations separated by 800 miles, those people will need to get on airplanes, and tickets are not getting any cheaper.

At the corporate level we've concentrated on management training. The second tier focused on technical professionals--we are a member and one of the original sponsors of the National Technological University. We have seventeen sites with over thirty graduate students in that system. That system is working. But it's just the tip of the iceberg as to where the real needs will be.

I'd like to make some final remarks on the future. It is time for business and education to come together to attack the training and education needs of America. The need is driven by competition. We have the communication technology and the networks, heartland America can no longer rely on horse-and-buggy technology to solve its problems. The rapid change we are experiencing is an opportunity to play the second half of the game. Our competitors have given us some clues as to how to use the brainpower in our organizations, our challenge is to assemble an innovative team to help us become learning organizations. Bob Zach made an important point yesterday. He said 80 percent of what you do can be automated. You need to figure out what the other 20 percent is and sharpen your skills to do it well.

This conference is an example of bridging. I hope I've given you an opportunity to look under the tent of one industry. From an industrial perspective the crisis is now. I believe industry has awakened, it's going to be a marketplace for each of you, and we need your skills to accomplish the tasks at hand.

Panelist: Arthur Slater
Instructional Program Development, Interactive Courseware
United States Navy

I work for the United States Navy and the Air Force. I have been a Marine. Many of my colleagues work for the Army. What's my connection to distance education? I've spent more time as a faculty member working on projects for the Florida Board of Regents, University of South Florida and Florida State University than I have working with the military, so I feel a great deal of kinship with this group.

The issues of this conference as I understand them are: distance learning, managing the information age and providing access to training and education. These issues are of critical importance to the United States military as well. Look at the training problem: 600,000 Navy personnel are stationed aboard 600 ships and hundreds of land-based sites; aircraft carriers have a complement of 3,500 personnel, with their air-wing aboard, over 5,000; destroyers and smaller ships each carry 175 people; submarine tenders, 1,200 people; submarine crews, of which there are two for each submarine, 160 people each.

The Navy has two kinds of programs. One is voluntary education. How do I get a degree? The other is required technical training. I have more responsibility for the latter, but first I would like to talk about the voluntary education program.

A vignette: Meet Petty Officer, Second Class, Leonard Jones. (These names are fictitious.) He joined the Navy for an education. He's an electronics technician aboard the Trident submarine. He made rank quickly. He's twenty-four years old. He intended to leave the Navy after eight years, after he got his baccalaureate degree, which he earned in six-and-a-half years. He has seen the world, and is now considering staying in the Navy for twenty years to retirement. He will be up for promotion soon and his chances look good. He says he owes what he is to the Navy, the Navy education. He is the first college graduate in his entire family. This is a typical case. Twenty to 30 percent of the sailors join the Navy for its voluntary education benefits. One program comprises over 6,000 independent study courses. I'm sure many of the colleges and universities that you work at provide a number of these. Some instruction is computer-based. The courses range from high school through college graduate level courses.

We have an examination program. It includes five or six different types of examinations: high school equivalency, GREs, college admission exams, certification exams and guidance tests. In 700 locations, the Navy provided 200,000 of these exams in 1989. Over 550 colleges and universities participate. The general theme is nontraditional programs with reduced residency requirements. At the associate and baccalaureate levels, 3,200 people in the Navy participated in this program last year.

We offer another program in external degrees. We offer college credit for military occupational training, military courses convert to college education credit in some universities. Another program provides experiential learning assessment. PACE is a program in residency, Program for Afloat College Education. College instructors board ships at sea and provide college courses. Two-hundred ships out of 600 participated in this program last year. There is a PACE II program in electronic instruction--computer-based instruction workbooks, for example. Over 20,000 sailors participated in these PACE programs last year. In these voluntary education programs there were nearly 100,000 enrolled last year. There were 1,410 who earned some form of college degree.

Let me switch now to my area, required technical training courses. Sailors take these courses after they get out of boot camp and have been assigned to a ship or a land-based site. Here is the scope of the training problem: last year 96,000 people were recruited, they went through ninety recruit training centers. Nearly an equal amount retired or in some other way separated from the Navy.

Another vignette: Meet Quartermaster Sally Russo. She navigates the USS Lexington, an aircraft carrier used for training. She is an expert in celestial navigation. She practices her skills using interactive video disc programs created to help train quartermasters and keep their skills current. She says she didn't know she trained personnel assigned to her before the Celestial Navigation Interactive Video Disc course was implemented as part of the on-board training program. There are about twenty-two quartermasters aboard the USS Lexington. She's the senior person.

The required technical training courses are

necessitated by a specific Navy job. You'll identify with some of our important issues, which I deal with every day. One of them is schoolhouse versus computer training (VTT or video teletraining as we call it in the Navy). There is a strong tradition in the military to attend a school. With personnel all over the world, how do we send them all back to Keesler Air Force Base for training? How do we send them to Pensacola? How do we send them to the Great Lakes? The costs are staggering. So some sort of distance education has to be used. Computer training and video teletraining present challenges.

Consider computers aboard ship. These 600 ships have over 7,000 personal computers aboard them, perfect for training. Well, not quite so. The Administrative Officer has one at his desk, he uses it frequently throughout the day. It's at his desk, and he often works at his desk. To find another computer available for training he might have to bring somebody from the boiler room to a work station or into the medical dispensary where people are being examined with their clothes off. It just doesn't make sense. So one of the issues is to designate more computers solely for training and education, away from their usual functions.

Satellite dishes aboard ships present another problem. Yes, the Navy has experimented with them, they work, and the cost of the technology is dropping. But we need these satellite dishes to receive transmissions aboard ship so we can conduct video teletraining courses at sea, not only in port.

Another issue is course-work distribution for the large amount of computer training that we do. We have been distributing work on diskettes, so we have a window of 360K for all our graphics and the rest of the lesson. The cost for me to distribute one piece of course work, seven to eight hours of training on ten or eleven diskettes to 1,000 sites around the world costs about $15,000. I have made a proposal to switch to CD ROM. The cost of distributing not one course, but fifty courses on a single CD ROM per site is about $3 per site--or $3,000 to 1,000 sites. This entails a trade-off. We need to buy the disk drives. However, buying 1,000 CD ROM drives at $495 a piece, the latest GSA prices, the payback would take only one year. Private industry generally considers payback within five or six years to be a good deal. The first time I calculated the figure, I thought I was surely off by a couple of decimal points. I went back to my calculator

and decided we had to start doing this.

How do we keep the interest of people that are not in voluntary education? These are often poorly motivated people. Many of them come from homes with few books. Motivational technologists tell us to move from the topical presentation of military material--or any military material for that matter--to content that has a story line. Don't teach them about everything they might encounter while on fire watch. Instead, drop them into an exciting scenario in which they must respond and learn. That's one of our biggest trends.

I am very involved in structuring a literacy program in the Navy. One out of four recruits who went through military training in 1989--24,000 out of 96,000--read beneath the ninth grade level. They are all readers. They read between the fourth- and the ninth-grade levels. Not too many read at the fourth and not too many at the fifth, but many are at the sixth grade level. This is a challenge to us as it is to industry. As a citizen of the United States I'm embarrassed for our education system.

I'm starting a large project on basic damage control. It will entail 100 hours of computer-based training and 15 man-years to develop. I will do this in 11 months. One of the issues is one I've heard many of you mention: how do we deliver courses in a timely manner, without a two-or three-year lag time? How do we get it there almost immediately? Our strategy is to modularize everything, we'll put the first lessons on-line within two months of when the project started this August 1.

I've outlined a number of issues in the military. I think these are your issues too. The trend toward distance education and its associated technology is strong in the military. Costs drive these innovations. Events in the Middle East these last few days impact the economics of education. Transportation costs are rising, consequently, schoolhouse training has become more expensive. The costs to transport students has risen overnight by about 20 percent. It makes a good argument to divert some of the monies into alternative delivery structures--to provide distance education.

Our keynote speaker, David Zach, said that the technology is there, but we are limited by our imaginations. We are in the military, I know. Thank you very much.

Distance Education in Higher Education: Lessons Learned and Challenges Ahead

by Shirley M. Davis, Purdue University

Invited Presentation at the
Sixth Annual Conference on Distance Teaching/Learning
August, 1990 - Madison, Wisconsin

When it's late in the conference AND early in the morning, we have a special challenge ahead of us. You are all to be congratulated for being here. Now, we'll see if my comments can be compelling enough to keep your attention.

I have just six things to tell you -- some basic truths, derived through lots of experiences and hard questions I have asked others and myself. Perhaps this is analogous to Fulghum's approach in the book All I Really Need to Know I Learned in Kindergarten (Fulghum 1986). There appear to be some basic truths that we should acknowledge about life and about distance education. And to be true to the assignment given me by Chris Olgren, I will divide these six truths under the headings "lessons learned" - three basic things that we learned the hard way but now view as essential to success - and "challenges ahead" - because in the rapidly evolving area of distance education we must always keep at least one eye on the future.

But first a broader observation: when it comes to distance education and higher education, we must acknowledge that, with a few shining exceptions, higher education has been a follower and not a leader. Our own research shows that distant students learn as well, even better, than on-campus students; our marketing studies and evaluations show that students like the convenience and flexibility of distance education; more citizens recognize the need for post-secondary education; there are many distance education success stories to be found; the technologies of distance education are becoming more available, user-friendly, and economical. And yet the reaction from higher education is shockingly uneven. For example, Purdue is generally considered to be one of several dozen leaders in distance education, but the entire effort touches only five of our ten schools and 16 of our 60 academic units. The issues reach beyond cost, successful demonstrations, and market interest to matters that lie at the heart of higher education. One is tempted to acknowledge as an enduring truth the comments by Cavert in the 1982 Green Chair Group report "Predicting Distance Education in the Year 2001":

> Futurists see beyond the horizon to plan for things that will be. Innovators see what's on the horizon and adapt structures and systems to get there. Experimenters rush a few steps ahead and then stop to analyze how they got there. Pragmatists follow established paths, carefully avoiding where others have stumbled and fallen. Educational administrators more often than not face the wrong way,

choosing to avoid change rather than deal with its risks. (p.26)

So, this talk is for the innovators and pragmatists among you. I trust that there are none here that fall into this category of educational administrator -- we'll comment more on their role later. I hope those of you who see yourselves as experimenters will be able to stretch yourself into innovators given the insights gained at this conference. And if there are any true futurists here -- and I sincerely hope there are -- please help us all by pushing our horizons and expanding our vision.

So, for the pragmatists: three "lessons learned" - a chance to avoid traps that have already snagged some of us.

Lesson One: "Murphy will get you if you don't watch out." I wish I knew who "Murphy" was, the one we credit with the axiom "If anything can go wrong, it will." Certainly his presence is felt in distance education much like the goblins in Riley's poem about "Little Orphan Annie." Some days all we can do is wistfully recite: "Cause Murphy will get you if you don't watch out."

Just last fall, for example, we were caught. We had a special audio teleconference seminar set up with a highly recognized authority in audiology and speech sciences as the principal speaker. The seminar participants were teachers of communicatively handicapped elementary students, assembled in groups of three to five at 20 locations around the state. They had used this technology many times before for credit and non-credit courses.

At the originating site, our speaker had her notes assembled, ready to launch into the hour-long discussion, and the program coordinator helped her adjust the hands-free microphone. Introductions were made and our speaker started, her soft voice carried throughout the state, but only for a few instants. Her voice was one of those few that cannot hold a bridge. The system kept cutting out on her, and the audience could never catch a complete sentence. The conference operator turned knobs and tweeked all controls available to her, but there was nothing that could be done. Murphy had caught us! Why hadn't we done a system check earlier? Like Little Orphan Annie, we must "watch out" and then be ready to respond with an alternative when when Murphy attacks.

Lesson Two: Distance education requires us to build and nurture effective partnerships, an uncommon and often uncomfortable activity for educational institutions. Most of our institutions develop programs and policies rather independently. While we certainly watch demographic and economic factors that bear on our destiny, we take pride in being guided by internal wisdom in concert with controlling bodies and accrediting agencies, but not generally in concert with other institutions.

Distance education, on the other hand, tends to pull people

together into partnerships and alliances -- especially when telecommunications-based delivery is used. It is often the cost that sends us looking for partners; or the range of specialized knowledge required. And since we can't physically be everywhere our programs are, we must also develop effective relationships with other entities located where our students are. In Indiana, we have an exceptional partnership developed among the institutions of higher education (both public and private), the State of Indiana, and many of the state's major businesses (Swain, Davis & Garrod, 1989). Such partnerships take years to develop and require continual nurturing but are part of the fabric of success.

The aim of partnering is for each of us to become stakeholders in a joint activity and treat it as our own. This lesson was driven home to us on a dark and stormy night in November. Live Pharmacy Continuing Education classes were being delivered by microwave throughout the state, and the director of the program, wishing to showcase its success for legislators, invited a dozen of them to attend at a site close to the state capitol. Since pharmacists work into the evening hours, the continuing education programs started at 9:00 pm., after technical support people and building personnel at the reception site generally leave for the day. As luck would have it, on this one night, for some reason we will never fully know, the doors to the classroom building were locked, and as the class members and the guest legislators arrived so did the rain and the wind. A distance educator's nightmare! We had counted on a partner that did not share in ownership of the program.

Since then, we call sites the day before a broadcast, remind them how much we are counting on them, see if they have any last minute concerns, and keep those bridges strong. The response has been phenomenal. We can't do it without partners.

Lesson Three: Administrative support for distance education is essential. This statement may not come as a surprise to any of you, but as I talk to people around the country and consider the situation at my own university, this lesson is reconfirmed. Where there is a strong backing for distance education from a dean or vice president, or even the president, things can move in phenomenal ways. Without this, all of the concerns about building partnerships and keeping the technology in grasp are moot.

When distance education practitioners recite the litany of barriers in higher education, what do we hear -- or what have we heard ourselves saying? "Faculty aren't jumping at the chance to sign up; they just don't see the potential;" or "Distance education does not contribute to faculty promotion or tenure;" or "Distance education can't be as good as traditional classroom education and my university is not interested;" or "We don't know how to do it and don't have the time to learn," also translated as "We have enough to do with the traditional students who make it to campus; don't bother us with the ones who have special needs."

Ginny Pearson of the University of Missouri conducted a relevant Delphi study in 1989 to identify factors critical to the implementation of distance education programs in educational institutions (Pearson 1989). The thirty distance education administrators who participated in the study identified the first five factors, all of which relate to administrative support, as:

1. Identified need (perceived or real) for the program.
2. Faculty and teachers supported and given incentives for motivation.
3. Funds for capital costs: production, equipment, facilities.
4. Availability of on-going money for operations and expenses.
5. Quality of the educational content of the program (evaluation).

Items 2, 3, and 4 are directly related to the degree of administrative support for distance education, since faculty incentives and fund allocation are administrative decisions, but even Items 1 and 5 are related.

Take the first: "identified need for the program." Identifying the need is essentially a marketing question, but even when needs have been identified, administrative constraints may control when and how service is given or to whom. For example, when a program must be financially self-supporting, a constraint not imposed on traditional academic departments, an identified need may go unmet. Similarly the fifth factor: "quality of the educational content of the program" can be significantly enhanced by providing time and funds for faculty training and instructional design.

Without administrative support, staff in the trenches work on bits and pieces of the problem but can get awfully black-and-blue in the process and have little to show for their efforts.

So much for the lessons learned -- we do learn from history if we are wise -- but it is a part of my outlook to want to turn quickly to the opportunities ahead. To turn to Fulgham again, as he cites the Storyteller's Creed, "...hope always triumphs over experience..." (Fulgham 1986, p. viii). Maybe this should be the motto of the survivors, risk-takers, and innovators among us.

For the innovators, now, I'd like to turn to three crucial challenges I see for distance education in higher education.

Challenge One: Our students are evolving into consumers, engaging in comparative shopping for education. Now, that certainly isn't bad, in fact we could argue that competition and accountability

are long overdue for higher education. Interesting that distance education is one of the forces contributing to this development.

Futurists tell us that students will some day be able to choose between a full range of courses from local campuses and those delivered via distance education directly into their homes from campuses that may be five miles from them or 500 miles or 5000 miles. Correspondence study has provided this choice and flexibility in university courses for 100 years, but the immediacy of telecommunications delivery and its growing acceptance are attracting new attention among potential students.

What will be the views of these new educational shoppers? They will seek flexibility in scheduling and in course requirements; they will be cost-conscious; they will expect service and support; they will demand that they learn what they are given credit for knowing. This is not to say that school loyalties will disappear for even as consumers we have our favorite shops that may not be cheaper or give us the greatest choice but win us on some other basis. Higher education needs to make some adjustments in response to this student-centered reality. We need to focus on learning, not teaching; on performance, not attendance. We need to recognize the fact that people learn at many times and places, in a variety of ways. The classroom of the future will will extend to the workplace, libraries and homes. Learning will include accessing on-line services and databases, using the tools of the 1990's, our "interpersonal" computers, to support study.

If we really are student-centered, we will seek our niche, listen to our customers, and focus on the benefits of the educational services we provide. We can't make the mistake of trying to be all things to all people, but we must define our mission in terms of our customers and listen to them carefully.

Challenge Two: The technologies of distance education are evolving rapidly and have a fascinating tendency to converge. Almost as soon as we make a commitment to a specific technology for a program, questions arise about whether, in the light of newer developments, we made the right choice. Indiana's statewide microwave and ITFS system had operated for 15 years, but when satellite distribution came along in the early 1980's we wondered whether we had put our resources into an outmoded system. Then fiber optics became available, enabling us to transfer our microwave backbone to fiber, a change virtually unnoticed by the user but providing many possibilities for flexible expansion. Distance education will increasingly be bombarded by new technologies that capture our imagination, and perhaps also our resources.

As technologies are developing and our understanding of them grows, we are finding interesting ways for them to augment each other. Just a year ago we saw FAX messages parallel satellite teleconferences, and Rochester Institute of Technology reports in "Wiring the Ivory Tower" on their instructional videotape program augmented with computer conferencing, audio conferencing, and

personal computers (McNeil 1990). What opportunities instructional designers have with this array of technologies, along with some others that we haven't even dreamed of yet.

Complicating our response to technology, however, is our lack of an articulated theory of distance education that can direct the selection and use of technology. Until that theory is developed, tested and accepted, we will be buffeted by the winds of technological change and relegated to patterns of trial and error. The candid classroom concept, for example, is based on the assumption that an off-campus student needs only a window into the classroom and a line to talk. Many have raised questions about whether students learn as well as they might this way and whether the cost of the real-time technology or the inconvenience are really justified. Research frequently says no (see Ritchie 1990 for a thorough literature review), but theoreticians are still discussing this issue and redefining terms.

The fundamental question is: should we work to modify traditional teaching methods to fit new technologies, or do we want to conceptualize the learning process in entirely new ways to respond to new needs and new opportunities? As more technological options appear, costs decline, and students become more accepting of technologies, the questions become more insistent. As McNeil points out in "Wiring the Ivory Tower," the rapid pace of technological change is a double-edged sword bringing opportunity and obsolescence simultaneously (McNeil 1990). Can we develop the wisdom to respond to these advances?

Challenge Three: We face this challenge within our own institutions, the challenge to get the educational administrators turned around in the right direction and looking far enough ahead. There are issues for them to address, fight for and resolve such as: unequivocal agreement that education at a distance can be at least as good as traditional education and that distance itself is not the question; the recognition that education is a service and does not necessarily conform to state or jurisdictional boundaries; the conviction that collaboration among educational institutions of various sizes and strengths and alliances with non-academic bodies can create win-win situations for the institutions and our students.

In the recent decades, as educational institutions have been forced to become increasingly business-minded, one sure way to get the attention of the administration was to mention saving or making money. Now, after much misspent effort, distance educators more often articulate the real benefit of distance education: providing access to education and options for the underserved, whether in rural, urban, or worldwide locations. These underserved may be adults looking for beginning-level humanities courses at times and places where they can reasonably participate, or they may be post-graduate engineers in the South Pacific who need to update their knowledge of robotics. They may have money to spend on education or they may not.

Ignoring the possibilities of distance education is not a viable option for institutions. The penalties for standing on the sidelines include the continuing erosion of accountability for education as more entrepreneurial groups step in. We see this already as businesses educate their own staff and grant their own degrees. We see the FCC and the wireless cable lobby threatening to reduce educational frequency allocations because of our low use. If the existing institutions renege on their opportunity to be the premiere providers of education and to cooperate with the private sector, others will move in to meet the information-age demand for education.

We, as distance education professionals, are not the ones who can make policy changes in our institutions. Our task is to be the interpreters and promoters, then the facilitators and evaluators.

I am encouraged by what I see. The pile of sand on the distance education side of the balance is growing daily. I have seen three grains added in just the last two months:

1. The distribution by the Academy for Educational Development of a report entitled "Wiring the Ivory Tower." Compiled by Donald McNeil, it is the result of a round table discussion by blue ribbon educators and helps focus the issues related to higher education's reluctance to be wired, either to increase educational productivity on campus or for distance education.

2. The recognition by the National University Continuing Education Association that upper-level administrators at member institutions need information about educational telecommunications. NUCEA has scheduled an unprecedented pre-conference workshop next April with the aim to bring these administrators together with business leaders and to "empower them to make executive decisions on strategies for utilizing telecommunications."

3. The astonishing diversity and sophistication of approaches to distance education that are developing, as evidenced at this conference. I sense that as a group we are learning to question tradition effectively and are addressing key issues.

To conclude then, I'll quote Fulgham one last time. One of his wisdoms is that when the going gets tough, kids are taught to "hold hands and stick together." That's what conferences like this are all about -- we learn that we're not pioneering alone and we gain new strengths and strategies from each other.

But now it's time to fan out, to return to our institutions where we may be one of a very small group who comprehend the incredible potential of distance education. I'm energized by the idea that the balance may soon tip, and I'm optimistic that higher education will eventually assume its rightful role.

Please join me, individually, in that advocacy role, and then

come back to Madison next year to "hold hands" again, check progress and be renewed.

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Shirley Davis's speech is reprinted here as it was submitted by Ms. Davis.

RESPONDING TO NEW REALITIES: LESSONS LEARNED AND CHALLENGES AHEAD

Gail Arnall
Project Manager
Satellite Educational Resources Consortium (SERC)

My name is Gail Arnall and I am glad to be with you at this conference. It was enjoyable yesterday to participate in some of the sessions and lead one in which we talked extensively about how distance education works in the K-12 environment. I took seriously the title of this session, "Lessons Learned and Challenges Ahead." I could probably speak all day about the Satellite Educational Resources Consortium (SERC). But rather than do that and have you leave, I am going to talk about six lessons learned and four challenges. It's interesting, I have no perspective from the university level, and most of you do. This comes out of my personal experience working in K-12 and with various partners in the SERC effort.

First lesson learned: The consortium concept is a viable model for the production and delivery of K-12 programming and courses, credit courses and teacher in-service courses.

I am really high on consortia. SERC has its roots in the relationship between educational television state networks and the state departments of education. Those two agencies have worked a long time in the field of educational technology delivering ITV over the broadcast medium. When the planning group first started thinking about delivering fully credited courses via technology directly to high schools, the state director of the planning group for educational television said, "We cannot do this unless it is a fifty-fifty partnership with the education community. Consequently, the whole structure of SERC is such that if the state wants to join SERC they must go to the board of directors, the chief state school officer and the chief executive of the state educational television network. That has worked beautifully and we now have twenty states that are members, so we have a forty-person board. We also have three associate members, which are cities located in states that did not want to join or hadn't gotten their act together to join. These cities, however, wanted to join so they came to SERC in partnership with a local school district. That is the situation in Kansas City, Detroit and New York City. So SERC now encompasses twenty-three states.

Four hard-working advisory councils do day-to-day duties. This isn't your meet-once-a-year-and-hope-that-they-don't-ask-too-many-questions type of advisory council. These are working councils. The technical council is composed of the chief engineer of the state television network, educational network. Those folks are responsible for overseeing installation and maintenance of equipment, making sure things work all the way down to the building level throughout their state. This is a natural evolution from what they have already been doing. Although attending to satellite receiver equipment at the schools is a new duty, they certainly have other kinds of equipment.

The instructional direction is given by our instructional advisory council, which is also composed of people from the state department of education. These folks look at the courses, decide about pricing, when school starts and ends, what holidays we are going to take--all that nitty-gritty that needs to be worked out. It's a wonderful group of people. This group has met at 11:00 am every Wednesday, every week, for two years. We gave them Christmas off and a few weeks off in the summer, but other than that they are on the telephone and an audio bridge--all twenty-three of them--every week. They are absolutely essential for quickly achieving our goals.

An evaluation council composed of the state departments of education oversees our evaluation process. A production team composed of representatives from each of those entities creates the courses and the programs. My job as the project manager for the last two-and-a-half years has been to conduct the orchestra. Most of the work is done at the state level, Gordy Hanson could come up here and tell you all about that. He is one of the folks. Consortia are essential. I'm not sure distance education can be done without them. It is a wonderful form of working together.

Second lesson learned: There is a need for additional quality educational resources delivered via technology and the states and the schools will pay for it.

SERC began in a limited pilot semester, a self-imposed limit in the spring of 1988. That was a year-and-a-half ago. We started in that pilot, the instructional advisory council limited it--that group of people that meet every week. They said let's keep this contained so we can learn some things. We had 59 schools and 363 students in 2 high school courses in 14 states. And we learned a lot, and boy did we learn fast. The

following fall--that would have been last fall, our first full academic year--we had 330 schools and 3,300 students in 22 states enrolled in our courses. We finished our year this past June with 3,800 kids enrolled. We will begin this fall with 630 schools and over 5,100 students and we have added 3 additional courses. We are turning students away. We have over 1,200 students taking Japanese I and I think we could have 2,000. We simply had to limit it. We'll have almost 1,000 people taking Russian I, 600 people taking Physics, 600 people taking Advanced Placement Economics, 550 people taking Discrete Math. They had to spell it out for me, but the mathematicians say our kids need this course. We will offer Japanese II and Russian II with about 300 or 400 people in those classes.

The schools pay for it. They will pay $420 per student this year, each course per year. If it is a semester course, and we do have some, it is $210 a semester. Most of our schools had to put up funds to match the federal funds to buy the equipment. They found additional resources for the satellite receiver equipment, the telephone, the push-to-talk speaker phone, and, in some schools, the interactive keypad. It has been a joint effort with the schools, and they are willing to pay for it if it is what they need and it is good.

Third lesson learned: Resources can be offered that are comparable to if not cheaper than other alternatives.

The phrase that really defines SERC is high need, low number. SERC's mandate if you will, is to provide resources to a school where three or four kids want a course and the school cannot afford to have the teacher teaching three to four students, or, more often the case, there simply isn't a teacher qualified to teach the course. At that point SERC becomes a viable alternative.

We have a rule that no school can have more than twelve students in a class. In fact the average number of students per class in any one school is four. We often have two kids in a class. We are meeting the need that we set out to meet. Fifty-three percent of our schools are in rural areas, 10 percent are in highly urban areas and a smattering are in between. A good two-thirds of our schools are under 1,000, one-third are under 500 students. We serve schools that don't have the resources to provide high-level math and foreign

language, which is our emphasis.

Fourth lesson learned: Courses are effective, learning is taking place.

We have done extensive evaluation on the logistics of the SERC program and how we could be more helpful. But we now have the most vital feedback, evidence that learning takes place. Last year we did pre- and post-tests in math courses and this year our students, along with others in the nation, took the advanced placement exam in economics. We are just getting those test scores back. About half of the scores are in. (We call the students to get the scores. The college board can't give them directly to us.) Let me give you the good news. It appears that 75 percent of the SERC students scored 3, 4 or 5, scores for which most colleges will give credit for the course. Last year 40 percent of AP economics students nationwide received a 3, 4 or 5. So we're thinking we'd better give the teacher a raise, and of course she'll be asking for it.

We also have a couple of other studies. One is the department of education in Nebraska, the co-provider of the Japanese course. They did a control study in which they looked at traditional classroom teaching of Japanese compared with the performance of the students taking the SERC Japanese course. Our kids, the SERC kids, did significantly better on listening and written skills. We are encouraged by that. Unbeknownst to us some of our kids participated in a Georgia, yearly statewide language test in Japanese. They were up against students from traditional classrooms. Our kids placed first, second and third. We are learning how to do this.

You think, "I still don't get it. How can you do foreign language?" Let me digress slightly to explain our Japanese course. We do the video lesson Monday, Wednesday and Friday. On Tuesday and Thursday, because of the technology--not in spite of it--we are able to put our kids in groups of ten to twelve and have them converse with a native speaker located in Omaha, Nebraska. We have twenty-five native speakers who have the lesson for twenty minutes each Tuesday and Thursday with those kids. They follow a curriculum. They converse with the same speaker all year--once again, because of the technology not in spite of it. That mode of operating will continue this year for both Japanese I and II.

We are introducing these methods elsewhere. We experimented with different ways of teaching Russian. We are going to go to that model and have the conversational drill during the class one day a week for Russian I and II.

Fifth lesson learned: (I got into this one already.) Technology is not a barrier, it is an advantage.

You might wonder what happens if the satellite goes down or the equipment doesn't work, what does the school do? Those mishaps have occurred occasionally. We survived a hurricane in North Carolina in September and we have had floods and fires and all sorts of disasters. And we do have back-up systems on tape that can be delivered overnight. But research results indicate that despite a few problems, learning is not affected. I am recently realizing how structured and on-task our courses are compared with the traditional classroom. We start on the hour and for fifty minutes that lesson is focused and intense. There is not much downtime during that fifty minutes. In fact, some of the feedback is "slow it down, you are killing us. We need a little breathing room." We take those comments seriously. The facilitators are getting the word back, we are trying to do too much. But in a distance education environment you don't have the freedom to talk about the upcoming football game. We try to impart some personality, our teachers always wear sweatshirts of the various schools and the tone is friendly, but it is orchestrated and full. When the technology is down it is probably a relief. Okay, we can study and fix it. But for whatever reason, participants say downtime is not a problem and we will probably stop asking about it.

Interactivity is working; we use the telephone extensively for our math courses because they cover two semesters and this year in physics we will use a keypad interactive system, which we used all last year during the pilot semester for the math course. Every student taking Probability and Statistics picks up their keypad and puts in their ID number. This communicates with their computer, which is linked by modem to the computer in Kentucky. When Tom Gravis the math teacher says, "All right, let's do a pop quiz, here is the question," it could be true or false, multiple choice, it could require the math solution, punch it in, it goes to the computer. Within two or three minutes the monitor on Tom's desk displays a bar graph and he can say, "Golly, 30 percent of you didn't get this right. Let's try it again." This has wonderful benefits and a

great future for accommodating large numbers of people, because the computer in Kentucky keeps track of individual performances. If we have it individualized we can group it and see what the students are doing. Most of the testing for the math course is done this way, which is quick. All of our other courses operate through the mail--not a good situation because it takes too long to get the test back. The test loses its educational value. This is the future, if you know someone from Kentucky tell them they are doing great work. The Kentucky Educational Television Network is leading us into a new age.

By the way, they didn't build this. The equipment was used at local bars for playing Monday Night Football. My husband and I tried it. You give them five dollars and your driver's license and then you call the next play. On Tuesday they play trivia. Anyway, KET got a hold of this thing and reprogrammed it. John Gorman in Kentucky is a genius. He said, "Oh, we can call it Probability and Statistics or we can call it Physics." They only have to buy one and then they can do three different courses. This wonderful piece of work will have implications for all of us because it is the kind of response mechanism that we want our students to have.

Sixth lesson learned: Organization is key.

If you are forming a consortium I recommend that you get somebody from the armed forces to organize it. I heard Arthur Slater yesterday and I agreed completely. Go to the military. You need somebody with extensive experience moving resources and people on a time line. That is absolutely not my background, nor do I want it to be. I don't think that way, but I need someone who does. We have a retired army captain. She is wonderful, she operates instinctively. For example, the last two weeks we shipped out $160,000 worth of textbooks to our schools. Do you know what buying $160,000 worth of equipment entails? It is mind boggling. My advice to you--a lesson learned from experience--hire somebody from the military. Those are hard lessons to learn and the military teaches them. Organization is the key but it needs to be in the background. You don't want to have people jerk your time lines, and you can minimize that if you are better organized. That is what you want to strive for, and Nancy Blanton has made that happen for us.

Those are the six lessons learned. There are lots more but those are the ones that I think make sense today.

I have four challenges.

One, let's not duplicate the problems of traditional classrooms that we who have learned and taught in traditional classrooms have faced. Technology can modify delivery, production and the way that we think about courses in such a way that we can provide courses that meet different learning styles. I am just becoming aware of some of this, perhaps you thought of this. People learning in different ways, some are focused and others not--some learn better when they are eating. I was talking to an LSU person, who is not here, and she said research shows kids want to start eating because they are watching the television course. Evidently that is acceptable.

We teach Japanese three times a day, nineteen hours of live instruction. Japanese is coming out of Nebraska. Kentucky is doing math and physics, South Carolina advanced placement in economics and Russian. Alabama will do Honors World Geography this coming year. Those are just our high school courses. All of our classes run at least twice a day, most of them three times to accommodate bell schedules, numbers of students and time zones. Wisconsin is doing an extensive amount of teacher in-service in the afternoon. New Jersey and Louisiana are also doing teacher in-service--we are all over in terms of production. That is another factor affecting orchestration. We have three sections for a given course, suppose it's Advanced Placement Economics. Wouldn't it be interesting to hone in on the different ways people learn? One section would be for one type of learner, and the second section for another type of learner. We would use the technology to modify the way we teach the course. We already have a lot of variables, I don't know when we would be able to implement such a program. But let's not do the typical traditional classroom over satellite. Let's do it more creatively than that.

The second challenge is to not get ahead of ourselves. I am hesitant to get into this one, you can take it for what it is worth. Yesterday, just before lunch the panel discussed the need to promote ourselves. I think that is a need. But I get a little nervous when I think we may get out in front of ourselves and therefore not be able to afford to make the mistakes that we must make if we are going to learn to use this technology. We have a lot more mistakes to make, and if we become too visible too quickly we won't politically be able to afford mistakes. Each situation differs but bear in mind that you may want to keep a

low profile a little longer to improve your program. Otherwise you may get locked in and lack the elbow room that you need to be creative. There is no perfect way to do this after all and we want to retain as much flexibility as possible.

The third challenge is to better measure effectiveness. I get two questions most often. One is, is this a cost-effective way to deliver education? And my answer is compared to what? At what point was education measured in terms of cost-effectiveness? But we need a response to that. And secondly, is this as good as a traditional classroom? My answer is the traditional classroom is not the standard. We have got to do better than that in most situations.

The fourth challenge is to keep sharing all of our experiences, this conference is a beautiful illustration of that. We continue to find ways to talk to one another and share information. Yesterday's concurrent session provided all sorts of good ideas that we can experiment with. So as hard as it is for practitioners to take time to come to meetings or to write--please, stay up late and write. Because we need to hear from one another and I need to hear from all of you.

RESPONDING TO NEW REALITIES: LESSONS LEARNED AND CHALLENGES AHEAD

EDUCATION/INDUSTRY PARTNERSHIPS

Cheryl Maier
Executive Director
Industry Education Council

I'm Cheryl Maier, director of the Industry Education Council in Santa Clara County, but today I represent the point of view of John Wade, the manager of Engineering and Technical Education for National Semiconductor. The company employs about 5,000 people in our county and about 30,000 worldwide. Prior to taking this job, I didn't know what a semiconductor was. It's not important to my talk, just keep in mind the perspective of a corporation in terms of the context of my remarks.

National Semiconductor has been a member of the Industry Education Council for more than ten years. During that period the company has seen the rise and ebb of business conditions. Training departments staff up to two- or three-dozen professionals, and then diminish the department by the red pencil down to one person. John Wade has been that one person during several of these bad business cycles, so he would come to you this morning with a real breadth of experience--he's been at the high end of a budget and the absolute low end.

From our partnership and our network we have learned a couple of things. First of all, business needs are always dictated by the economy in which they operate. It is a way of thinking that we as educators must come to understand. It's impossible to approach a company, whether the company is large or small, or to use your entree through a trade association or a professional organization, if you are not familiar with what's going on in the business pages, and if you're not knowledgeable about what the company's economic situation is at the time. Are they down-sizing? Are they laying off? Are they trying to enhance their work force? We as educators and professionals must expose ourselves to those business concepts. Whether you are in the K-12 system or higher education you must become knowledgeable, because money and resources are available from the private sector, but only if we understand that their needs in terms of distance education are market-driven.

We have learned that business and industry want a self-directed work force. Some employees are trained in universities, others achieve their skills through on-the-job training and long periods of employment with the company--but no employee can coast on their current skills. They need to upgrade, enhance, change and be flexible in their skill base. In our area we have learned that the shelf-life of a "double-E" degree engineer is only about five years. Whether they graduate from Stanford University or from this institution, their knowledge base will change completely within a five-year period. For chemical engineers it's about the same. For mechanical engineers it's an even smaller base. So, even the most talented people within any of these companies must be committed to lifelong learning. They have to consider and accept that more than one career may be necessary in their work life. So a self-directed work force can be educated via distance education if you adopt both the mindset and the language of your surrounding business community.

Another lesson we've learned is that the American economy and the American work force will never be as homogeneous as those of the Japanese or Koreans who have been touted as our successors in the global economy. We must adapt our learning systems to the multicultural, multi-ethnic work force of this country. That includes, in our state, being responsive to large numbers of Asians and Hispanics, including Mexican-Americans and Central and South Americans. We have to accommodate the Japanese and Koreans, many of whom work in California companies. Therefore, cross-cultural communication becomes more than a nicety, a concept on your video conference schedule once a year. It becomes a whole plate, a whole cafeteria of instruction that must be incorporated into the American work force. Distance learning is one grand source of that kind of programming.

I present some of these lessons because, while these concepts may have been introduced in an ad hoc video conference or two over the course of the last few years, we in education still have not become adequately versed in the language and the needs of business and industry. We must offer programs that business and industry can grab hold of and turn into a valuable series that serves their corporate culture.

Business and industry are coming to terms with an issue with which educators have been familiar for a long time: adults have many different learning styles. You

cannot devise a corporate educational plan that only accommodates one specific teaching/learning style such as the stand-up lecturer. Because of the diverse needs of adult learners, the flexibility and responsiveness of education via telecommunications has an advantage--it's up to us to turn that advantage into revenue for our own distance education systems.

We've learned from business and industry that they place a tremendous value on time. Educators have a sense of longevity about the challenge of education, industry does not view time in that manner. Time translates into money, and business executives feel that education is time wasted if it is not time-intensive. If the content is not dense and driven, it can fall off the plate very quickly. We've learned that video conferencing and distance education programming must be as short and as content-dense as possible. Our challenge is therefore to scrutinize our educational products to ensure that they can contribute to business profitability.

Increasingly, industry is investing in more than just the delivery of education to every level of its work force, they're investing in research as to what educational format will work best for them. The Carnegie Report of 1984-1985 revealed that business and industry were spending, on their own education programs, an amount equivalent to the total cost of all education programs, kindergarten through post-secondary, in the United States. Since then we have seen more and more industry studies that show the need for a more highly structured educational system in business and industry. In the Silicon Valley we have four or five traditional universities such as Stanford University or Santa Clara University or San Jose State University. But we also have Intell University, Apple University and Sun Microsystems University, which reflects that education at every level has not met the profitability needs of those major global corporations. They have formed their own universities. We need to take a page from that, because those classes are, again, market-driven, and they are designed to meet the needs of our corporations. Many of those universities, Apple, Intell and Sun U., incorporate TV programming as part of their menu, but they have come to understand that there is not one single, traditional adult learning style, and therefore they offer a variety of approaches.

To meet our challenges, we depend on vision and volunteerism from our corporate membership base.

Companies in our area (I don't mean to be California-specific, many of these companies have sites in your communities), are interested in restructuring the relationship between the private sector and the schools so that they can increase their commitment to education. It is our challenge to make that volunteerism a reality, especially since we need and desire to receive corporate contributions to our own educational process. But money and equipment are not enough, we need to nurture and coordinate relationships with individual people at every level of employment within the private sector, because there is something to be contributed to and gained by the educational process.

We need to recognize that the window of opportunity for business and industry, in terms of giving their employees new information, new knowledge, new technology transfer, is a very short, time-specific window. Business and industry view education as a short path to the future. We must be quick to respond to that. We shouldn't flesh out every detail in our programming. We must provide a timely, content-driven outline so that corporations that do a value added program, in addition to what we provide via satellite, can structure something that is timely and specific to the needs of their employee group.

Program content continues to be a tremendous challenge. Far too many distance learning programs start with the kernel of a good idea and then waste time on satellite fleshing out that idea to deliver a whole program. Business and industry do not need or want that extra programming.

Production quality is still an issue, and we have many quality control sessions where employee groups walk out of a video conference because it was mismarketed. In fact, it was misrepresented on the advertising. It is not possible, with a low-production video conference or training session, to hold the interest of an employee group whose time equals dollars.

We must find new approaches to weave small companies and smaller groups into this large infrastructure of universities and corporations. We have to find ways of identifying education for small companies that allows them to come in at an appropriate level for their budgets and to benefit from the overview that distance education can provide.

The concept of lifelong learning begins to soften the

lines between educational levels. Secondary, post-secondary, community college, higher education--the distinctions blur. Within the context of the work force the shelf-life of people's knowledge base diminishes. One of our colleagues on the task force told us that her company, Hewlett-Packard, doesn't pay more for a degree from Stanford University than from any other university. Once the information base is acquired, the value is in its application within the corporate structure. Corporations are as interested in the ad hoc video conference providing a short, intense training session as they are in the continuing education course for a degree. That's a lesson that we need to learn. We need to think about what we're losing when we elongate the educational process.

Finally, we've learned that once you've demonstrated that you are in there for the long haul, that you are dedicated to the mission that your organization has put forward in terms of distance education, it is possible to go to business and industry and ask for hard dollars to augment or enhance your system. We have been in business delivering education to industry via satellite and microwave for six years, and as John Wade said on our videotape yesterday, "We intend to stay in this business a long time." There's a lot of fundamental, nitty-gritty, nuts-and-bolts information that we've acquired. We'd be happy to answer any questions. I think that this whole conference has been an excellent lesson in terms of partnerships between business and industry and education. I thank you.

RESPONDING TO NEW REALITIES: LESSONS LEARNED AND CHALLENGES AHEAD

BUSINESS AND INDUSTRY

John Whaite
National Semiconductor

I'll start off with some background information. Our county office of education in Santa Clara County has an eight-channel ITFS system. We have four satellite dishes, two C-band and two Ku-band. We have two classroom studios from which we can originate programming. That's why we do distance education. Our system reaches the county to the north of Santa Clara and, through our networking with our state university, San Jose State, we reach Monterey County. Our system is extended through our ITFS system to reach a significant number. In our own county we reach over 200 schools--7 community colleges and over 200,000 students.

Our Silicon Valley industry reaches over 1,000 employees. In May, we did our first up-link. We up-linked for a nationwide video conference with the National Technological University. Our partnership with the Industry Education Council has brought business resources and viewpoints in contact with our system. We jointly tackle problem-solving and together plan nationwide video conferences, large projects and for equipment needs. We also combine our personnel so that we don't hire people we need only for short periods. We meet weekly, in a subcommittee--planning programs or marketing strategies--and we meet in a large task group. Thirty-six Silicon Valley companies sit on that committee.

Why distance education in the Silicon Valley? One of the main reasons is traffic grid-lock. We move very slowly through the valley, trying to get from one place to another is difficult. Distance education has solved a lot of problems for our Silicon Valley people. They don't have to leave an hour-and-a-half early to get to a class, and then they don't have to spend another hour-and-a-half trying to get back. It's economically good for them. Parking is another problem, parking costs in California are more than in this part of the country.

I'm going to talk about the lessons we've learned specific to our own area, because so much of what I had planned to say has already been said.

We've learned about business. Business has finally realized that education is an ongoing dynamic business. Because industry has identified its own continuing needs for education, it realizes its higher stake in the quality of educational services of the larger community. We've learned that the K-12 system is a pipeline to employment--so has business and industry. If the pipeline is not constantly monitored, and if the raw materials going in are not supplemented, the end-product will be a weak and unskilled work force. We've learned that business is interested in helping to restructure public education. They want to promote concepts such as competitiveness--market conditions--into our school administration.

We've learned that business and education want to capitalize on each other. Education has realized the need for alternative delivery systems, as evidenced by our own creation of origination and working with both business and education. Educators, both in administration and classroom instruction are now required to become technologically literate. Teachers in California often find that their students are more knowledgeable about technology than they are, particularly in computer technology. Our state now requires our superintendents to take courses in computer literacy. They're learning how to use a bulletin board and E-Mail--all these wonderful things that they haven't had time to learn. Now, because they're required, they're learning. In our office we have developed a technology plan. We're trying to bring in state-of-the-art equipment and we're hoping that business can speed the transition of educators into a state of work-place literacy by contributing equipment and expertise.

We've learned that California is bringing experts together from public education and the private sector to forge local and statewide partnerships. Educators bring access to schools and industry brings resources. We've learned that California is looking to business and industry to achieve a multidisciplinary delivery system that integrates interactive television, computers, fiber optics and all other technologies.

We see four major challenges for education, the three R's: Reluctance, Resistance and Refusal. We need to eliminate the skepticism of traditional educators so that they'll collaborate on new training approaches available for teaching.

We need to somehow shock our educators out of complacency so that they'll realize their responsibility to teach with an eye to meeting the national challenge: to achieve the competitiveness and excellence that will help keep our nation where it needs to be in the international arena.

We need to be responsive to regional economics and public policy. We must keep ourselves balanced to accommodate regional requirements, such as the influx and influence of the multicultural work force or the pressure of competition in the international marketplace. In California, particularly in the San Jose Silicon Valley area, we've seen a large increase in the number of new Americans. Our teachers are frustrated that they can't even communicate with these children. All systems--K-12, community colleges, universities, business and industry--must cooperate to create the necessary educational infrastructure. That must be more than a local priority, it must be a national priority.

I'm going to give the floor to Cheryl, who will tell you about the business side of our partnership.

KEYNOTE: LEADERSHIP IN A NEW ERA MEETING THE CHALLENGE WITH CREATIVE VISION AND ACTION

Robert Theobold

Over 150 years ago a group of Germans in Michigan, and other parts of the country, made a commitment to education. They developed a system. It still exists. The system usually has fifty-minute classes. It runs for nine months a years so people can farm, which doesn't seem up-to-date to many of us anymore. It is a system above all which assumes that people need to be taught. People need to have a boss in front of the class, students are subordinates. And that was a heck of a good system for teaching people to live and be comfortable in the industrial era, to feel that they could make a contribution.

The problem is that we don't live in that world anymore. And the extraordinary paradox is that we all know it at some level, but the inertia of our culture keeps us from making fundamental changes. If we could poll educators across this country, they would probably say that the system doesn't work anymore. So let's talk first about what the new system would look like and where distance learning fits into that. The two key words are lifelong and learning. That is old rhetoric, but those two words still carry a lot of weight. Lifelong means from conception to death. We are learning extraordinary things about what the child learns in the womb. In addition, we are learning that if you wait until a child is five, that the child is already disadvantaged--you are going to find it difficult to catch up. We are also learning that children who are abused when they are young, anytime in their childhood, are likely to become abusers. How do you break that cycle? How do you break the cycle for the parents who are driven to abuse because it is the only path they know? So it is lifelong.

The other key word is learning. And learning and teaching are not the same thing. When we talk about distance learning I suspect all too often we mean distance teaching. We mean how do we convey information to people rather than how do we encourage them to learn? The model is truly different for learning. Sometimes we talk about remedial learning, remedial literacy. What we need is not remedial literacy; what we need is remedial enthusiasm. Our educational system knocks out the energy from people. It knocks out the self-esteem. A study recently came

out. I am not a big believer in statistics, except when they confirm my prejudices. But in this case they did: about 5 percent of kids leaving school have self-esteem. I mentioned this to a friend of mine, a former valedictorian of the school, who said, "I was seen as real bright, I got high grades, and I could not even get off the floor with my self-esteem." So we can bring kids out of school successfully in terms of our intellectual or academic standards. But we have lost that which makes those standards worthwhile. So I suggest that we need to concentrate on learning.

How do you break that down? It is a great statement. But does it mean anything? We are looking at a number of things. The first one has been talked about for a long time but it gets tricky when we try to implement it, namely to move away from being discipline-centered, to be issue- or problem-centered.

The disciplines cut reality into neat slices. There is a thing called economics, there is a thing called politics, there is a thing called sociology. Each one of these is separate, and then of course that wasn't enough. So we cut economics down into 100 subdisciplines, and that wasn't enough. Doctors studied minuscule parts of the body and we found out--although we haven't coped with the discovery yet--that you can't think in parts, you have to think in terms of the whole. You can't split down the globe into a geographical discipline and a political discipline and an economic discipline. They are all the same, which becomes evident as we pull together again. Russia isn't going to solve its problems solely through economics. Those economic problems combine with politics and sociology. Unless you look at it all together you end up with something that doesn't work in these times of turbulence and rapid change.

And so we must look at the whole. And we don't know much about that, except that we are moving forward on the basis of chaos theory, with which some of you might be familiar. Some of you may have read Chaos by Edward Glick. I am not a great reader, but it is one of the books I highly recommend. It explains the changing thinking in physical science. According to Glick, behind the apparent chaos of life is order. A great many physiological functions such as the pulse and the heartbeat are healthiest when they are chaotic rather than stable. Stability in the body may be unhealthy. If you evaluate education in those terms, one of the problems is that we have created a fake order that doesn't allow the chaos required for healthy learning

and healthy relationships.

Which brings us to the third point. We need to teach relationships in distance education. If all we do is transfer information, I don't think we are doing our job. Because the key skill for this new period is cooperation. The day when you could do it by yourself is long gone. I listened to a vice-president of a company recently and he stated that we encourage cheating. Everybody sort of sat up and said, what do you mean? And he said that our goal is to train people to work together creatively. I have always been amazed by the rhetoric when you go to a new school or new college. The message is: we want you to work together, except during brief periods which we call exams, and if you should be caught working together during those brief periods called exams you are going to be in deep trouble. We need to teach cooperation in school, in the classroom.

That leads to the final issue I want to discuss. The school and the college have become increasingly cut off from the rest of the world. We started with the goal that everybody should learn to read, write and figure. Then, in a typical Western, American way said, well, if a term of one year of education is good, two years is better; if two years of education is good, then four years is better; if four years is good, eight years is better; if eight years is good, then sixteen is better; and on to sixteen years of education, thirty-two years is better--and then somebody said well, perhaps not. Perhaps that is too much. Now people recognize that you cannot cut the school and the college off from the community. You cannot cut kids off from life.

Our schools have become isolated from the real world and we don't value what young people bring to us. We don't recognize that they have new skills. If I were to ask you parents in the audience if your kids are more skilled with computers than you are, most of you would say yes. And that frightens us, we don't know what it implies. We're dealing with information and knowledge in a new sense. People say that today's kids don't know their geography. There is some truth in that, but kids do know how to structure and move information in ways that absolutely boggle the mind. Watch kids playing computer games, they have dexterity, skills and systems abilities that most of us don't have.

Margaret Mead once said that we are all immigrants into a new world. We must face up to that. It is hard

learning. In the past it has been possible for teachers to say, we know, you learn. Now for the first time in human history we have to say, all of us are learners. The way to do that is to stop dealing with hard-and-fast answers, "If you do it this way, you will have the right answer," and to deal with questions where there is flexibility, where the answer is unclear. The teacher should be knowledgeable, but the student also has something to contribute. That is a whole different image of education. We are not talking about the master teacher in the discipline. We are talking about a master structure where people can think for themselves and be creative, where they have options, where they learn to follow an unmarked trail. This is where the best of multimedia work is becoming exciting, because it allows people to follow their own thread.

I know how many changes this brings about. The universe isn't nearly this tidy. You can't allocate credit as clearly. Maybe the semester concept breaks down. It is even possible that the traditional academic degree no longer adequately fulfills its function. There are tough decisions ahead for distance learning. Like so many other innovations, distance learning is tempted to do what was done before, but in a slightly different way. The classic example is the horseless carriage. When we named the new form of locomotion we concentrated on what we took away and called it the horseless carriage. We said it is still a carriage, but now we don't have a horse, we have a motor. Then we called it a motorcar because we had added something to it. Eventually it became the automobile because it was something new.

Distance learning, not surprisingly, started out by selling itself as a new way to deliver education--it was more efficient, less costly and reached more people. I understand that, and you may still need to use that reference. But distance learning is really a revolutionary technique. It is a learning technique that promises to deliver to anybody, at any time, information on any question. Think of the incredible range of opportunities. We are going to have satellites with 300 channels; dish prices dropping from $3,500, or $5,000 with scrambling equipment, to approximately $1,000 to $1,500. Consider the potential of fiber optics--we are behind the learning curve on distance learning, like so many other things.

Distance learning must address learning in a world that is changing faster than any of us can understand. I

called my most recent book The Rapids of Change because I believe we are going to undergo enormous turbulence. If you think you have seen a lot up to now, you haven't seen anything yet. Distance learning must be one of the tools by which people continue to learn, if not, then it won't work.

I don't have to remind you of the changes that are taking place. The USSR is disintegrating. Canada doesn't know which way to turn. Europe is trying to re-create itself, but England's role is unclear, Britain is holding back, trying to slow it down. We used to understand the world situation in terms of the two superpowers, we knew how to fight with each other. Ethnic unrest rocks the world. The savings and loan crisis promises to cost 5 hundred-billion dollars. Remember Evert Dickson said that a billion here and a billion there soon adds up to real money. Sometimes I feel that we ought to revise it. A 100 billion here and a 100 billion there soon adds up to real money, yet somehow we cannot get excited about it.

We need to deliver distance learning to people so that they can learn. That is the real challenge of our time. How do we as a society help people keep up with what is going on? It is a tough job.

I want to leave with a challenge. Down the line when your children ask you what you did in the 1990s, you can respond in one of several ways. You can say, I was unconscious and didn't know what was going on. Some people are like that, they don't know that the world changes. You can say I was scared, I stuck my head in the sand and hoped that it would all go away. Or you can say that it was the most exciting time in human history and I was part of it--I even played a little role. The Chinese have a curse: May you live in interesting times. I suggest we need to turn a curse into a blessing. Thank you very much.

SUMMARY ADDRESS: PRIORITIES FOR NEW LEARNING SYSTEMS

Howard Martin
Dean, Outreach Administration
University of Wisconsin-Madison

Thanks Pat for a very kind introduction. Chere Gibson, tries--as you know from the most of this conference--to get top people here. I was flattered to be asked to speak. Then I found out last week that she had written and asked the president of the University of Wisconsin System to speak. He turned it down and said why not invite the chancellor. The chancellor was also unable to speak. She wrote back again, frustrated, and she said, "Send me someone from the administration, but nobody lower than a dean." He wrote back and said, "There is nobody lower than a dean!" So here I am.

Truly, I'm honored to remark on what has been another successful Wisconsin Distance Teaching/Learning Conference, an annual conference that has grown by leaps and bounds in attendance and in the increased use of distance education techniques. You gave me a formidable task to summarize what's gone on, but I'll give it a go and not keep you too long.

Over the last two-and-one-half days you have heard what we all may expect within the decade and the next millennium. David Zach shared with us certain demographic trends and data. We also learned that Vanna White has to know the alphabet as well as be beautiful. More to the point however, he stated that we are in an era of educational failure at the high school level. We are drowning in rapidly evolving information, yet starved for knowledge. This age of information will require us to adapt and to solve problems. We will need to bypass traditional structures, particularly in education, that have not kept up with the times. Both labor and management must change. We will need to exercise our imaginations more. This will take more of our time and concentration since we, as Zach puts it, "live 'hyperlives' just skimming the surface of life." He forecasted that teachers shall be knowledge facilitators, that we should integrate subject areas, and that in the year 2000 education will be the largest single industry at the front line in economic wars. Our goals should be to be flexible and innovative, to focus on the high aims of lifelong learning and not the processes, and to bring a bounce to life in our

changing society with our children having valued reasons to live and to hope.
Robert DeSio addressed an ever-important subject for those of us in education--strategic planning. This next statement is no reflection upon DeSio's presentation, but I must confess that no matter what I read about planning, I can't tell the difference between strategic and long-range planning. If I understand him correctly, he calls upon us to take advantage of technology to think globally and not parochially, and have an educational strategic plan for life. Business and industry have the responsibility of preparing workers for the future as well as the present and in that vein they are responding far faster than educational institutions toward educational goals.

The academy, and I cannot agree more, is often too slow to respond to business and industry, particularly to their educational needs. DeSio has reminded us of the globalization of economies and the need to promote distance education to address this phenomenon. To plan strategically, long-range international infrastructures are required. We must break down the boundaries and statutes that set barriers against cooperation.

Our panel on new learning needs has once again called for change in the traditional higher education curriculum to more adequately address cultural and international change. It has called for the restructuring of educational systems by changing the way our legislatures think in order that we may, as you put it, get a better bang for the educational buck. Jack Ruff, our industry representative on that panel wisely pointed out that the United States needs training and skill building at all levels in industry, not just at the top. And this reminds me of the fact that the United States was the leader in tool making well after the Second World War. Now that leadership has been lost to West Germany. And some American industrialists can't understand that. They're second in terms of productivity. When they studied the problem they discovered that in the West German factories, research and development applied at all levels and hence training and skill were important priorities for West German industry.

Further, DeSio reminds us that industry is a marketplace for distance education. Both Ruff and the last speaker, Arthur Slater, representing distance education for the armed services, see the cost-effectiveness of satisfying their needs through distance education, and both face the challenge of

addressing basic-skill deficiencies via this means too. This is but one challenge--we have heard this morning what other challenges lay ahead.

Finally, Robert Theobold called upon us to meet those challenges with a call to question our regents' semester-by-semester educational system, to look toward relationships, not just among the different subject areas, but among teams of people working together, and to concentrate on how we learn in these times of rapid change. We must discover ways for teachers to teach subject matter. But teachers must also foster creativity and thinking for one's self. He calls for us to be flexible in a world of uncertainty.

It seems to me that our keynote addresses have come full circle. We are in a sense, back where we began on August 8. How do we deal with the explosion of knowledge? How do we challenge traditional educational structures and statutory barriers? How do we integrate subject matters? How do we encourage learning? As you leave this conference, you will think about these presentations as well as the seminars and other sessions you attended. However, we shall need to decide what to tackle first. When asked to make the closing presentation to this conference, I was reminded of the title of a film in my traditional English grammar school education--a school that stressed classical languages. And it seemed to me a catchy way of addressing priorities. The Latin title of that film is Quo Vadis, which I should like to translate freely as "whither now?" or "where are we going?" For that is the question all of us involved in distance education must ask ourselves as we ponder over the many presentations we have heard this week. Whither now? With all the new technology, teaching and learning systems, and educational needs--where are we going? Some of what I'm about to say will not be new to you. In fact, hearing Shirley Davis this morning I nearly asked her to give this speech. Because as I reviewed the many offerings of this conference, and I listened to your questions, it became clear that you have already reflected on some of the priorities for distance education. Let me mention but a few priorities from my perspective.

First, as the number of traditional-aged students declines over the next decade, as educational institutions use enrollment caps because of fiscal restraints imposed by state legislators, our priority will be to serve learners off-campus to a greater degree then ever imagined. But to do this we will have

to change the way our faculties and instructional staff view teaching. Steven Ehrman of the Annenberg Corporation for Public Broadcasting project wrote that "Critiques of distance learning often begin their challenge with the unspoken assumption that quality and accessibility are antithetical values. Bringing more people into the fold will dilute quality." Such critiques remind me of the queen--not the queen, but the one in Louis Carroll's Through The Looking Glass who said "I don't know what you mean by your way, all the ways about here belong to me." And I gather that I'm not the only one to borrow from Louis Carroll since Robert DeSio talked about which road to take if you don't know where you're going! Our first priority then, must be to convince the academy in its broadest sense that there are nontraditional ways to meet the educational needs of the people. In this vein, we must integrate distance education into the academic policy of our educational institutions. Even at great research universities, distance education must be one of the key elements of academic affairs. But first we must overcome the three R's--resistance, reluctance and refusal.

I heard this morning that the university here is about to appoint a council on outreach to deal with, among other things, the delivery of credit and noncredit programming off-campus as well as on, in classrooms as well as by instructional technology, to traditional students as well as nontraditional students. This kind of program must be an integral part of our colleges, schools and departments. Outreach is a part of the academic affairs and policies of our institutions. In light of what we have heard about the future, it must be a strong and integral part.

The second priority is not simply building partnerships between universities and business and industry--as important as those partnerships are to economic and professional development. In addition to building and strengthening partnerships among school systems, vocational systems and colleges and universities, we must look toward consortia among educational institutions.

Individually, we cannot be all things to all people, as Shirley Davis reminded us this morning. We must look to working together, sharing our resources, our delivery systems, not to developing our own turf. In the long haul we will not have the luxury of sufficient resources to build independent delivery systems. Much is to be gained by a concerted, cooperative effort to

serve the educational needs of our people. It is important for all of us to work closely with the departments of public instruction in order to provide further training of those charged with educating our greatest resource, our children.

No less important, we must respond more quickly to the training and retooling needs of business and industry as more people experience multiple career changes. This may seem idealistic to many in the academy, but as you know, it can be and is being done. You have already heard how schools equipped with ITFS equipment and other distance education technology can deliver programs to both teachers and children. Several businesses are installing or have installed systems so that employees may quickly obtain continuing education --on the job or at the site--in engineering advancements or developments in computer programming from afar. I am calling for an increased participatory approach to education.

This leads me to another priority. Simply put, with our new learning systems, we should search for ways in which to bring our best teachers and models into the inner cities and into the far away corners of the individual states not blessed with the best school systems. But in conjunction with this, we should focus on how we help people learn. We live, as you have heard many times, in a world where new knowledge and information emerges at an unprecedented rate. Our priority must not be the mere delivery of more and more information. We must rather, concentrate on how we enable people to process that information.

In our shrinking and interdependent world, the global village as it's called, we should seek to educate and to learn from not only those in this country, but those abroad. Through the creation of open universities, distance education is thriving in Asia. The Commonwealth of Learning, headquartered in Vancouver, with fifty member nations, is bringing distance education to the Third World Commonwealth countries. The Open Learning Agency in British Columbia works with Australia and Pacific Rim countries to produce and deliver distance education courses. The idea of a European open university is more than a twinkle in someone's eye, and the massive changes in Eastern Europe bring great opportunities for development of such a distance learning agency. These are, I am sure, but a few examples of what we in North America should emulate. The new technology, which this country has done much to develop, is responsible for the creation

of the global village with its instantaneous international communications, but that technology also provides us with the means for encouraging interaction among the people of the global village. Lest we forget that though, we must never lose sight of the fact that all those whom we wish to reach will not have the computers, the cable TV, the satellites, the video players of which we have the luxury. The medium we use to help people learn must be affordable and accessible to all learners. These then are what I believe are some of the top priorities for those of us in distance teaching and learning. I am sure there are many others.

Let me close by quoting another line or two from Through The Looking-Glass. "'I see nobody on the road,' said Alice. 'I only wish I had such eyes,' the king remarked in a fretful tone, 'to be able to see nobody and at a distance too.'" You, my friends I suggest, have such eyes. You are seeing into the future, and already addressing the needs and priorities of distance education. I have echoed in this summary, I hope, much of what you have already expressed. I wish you good luck and look forward to your returning next year in even greater numbers. Thank you.

SEMINARS

USING DISTANCE EDUCATION TO REACH OUT TO UNDERSERVED ADULT POPULATIONS

Barbara Sparks
Office Of Media Based Instruction
Division Of Outreach and Continuing Education
University of Wisconsin-Milwaukee

Introduction

There are few that would question the premise that educational technology is an access tool. Technology used in distance education can bring low enrollment academics to rural high school students, satellite teleconferencing can link participants with national leaders, private television networks can connect multiple divisions of corporations and national databases and on line utilities can provide linkages between students in distant locations.

While those who can afford the technology are increasing their knowledge base and maintaining a vital link with ongoing developments and advancements, the underserved populations of the nation are falling further and further behind. With the changing national demographics that researchers have outlined in numerous reports (U.S. Department of Labor, 1987; Kutscher, 1989; Reich, 1988) it becomes imperative to look at ways to increase educational access for all classes of people. The multiple minorities and women who will make up the new work force will need higher levels of education and skill development in order to fill the jobs of the information age in a global society. Designers and coordinators of distance education networks have the expertise and ability to put into place systems that allow increased accessibility to underserved adult populations.

Definitions

Who are the underserved adult populations of the United States? They are the more than 750,000 immigrants in need of English language courses who enter the country each year and who will by the year 2000 comprise 4 million to 6.8 million of the work force. They are the unemployed and the underemployed who live at or below the poverty level and require job and vocational skill training. They are the one third of the national adult population identified as functionally illiterate who read at less than equal to the full survival needs of our society (Kozol, 1985) requiring reading, writing, English and numeracy skills. They are the high school noncompleters, including 50% of the enrolled Hispanic youth and 35% of the enrolled African American youth. They are the rurally isolated who are often both economically and educationally disadvantaged. They are the elderly who for reasons of safety or lack of mobility are the most underepresented of all subgroups in adult education activities (Cross, 1979). National demographics identify the majority of these targeted populations as minorities and women.

In sum, they are diverse groups of people who have not been able to satisfy their educational needs through the formal education system.

The Promise Of Distance Education

Traditional adult education, like the elementary and secondary schooling system, serves the needs of the dominant culture. People from backgrounds other than mainstream middle-class tend to find the system of adult education difficult to understand or frequently find that there is a conflict between its norms and those that they find in their informal social system (Cropley, 1989).

Minorities, the undereducated, those with low income and part time jobs and the elderly, although a numerical majority, are not well served as far as access to adult education is concerned.
A look at the educational needs of the targeted groups reveals a range of topics including basic education, vocational training, community development and life skills to facilitate problem solving for dealing with community problems prevalent in inner cities and isolated rural locations.

These differing needs are not content areas that have received substantial financial support for development, consequently, we do not find underserved adults enrolling in the majority of traditional adult education courses. In addition, the learning needs of these diverse groups require flexible models of design and delivery differ from the traditional models currently in practice.

Distance technologies including television, radio, computers and multi-media, offer the potential for increased access to information and can become more than a promise, if we move beyond the current use of technology which is primarily a tool of the middle class. This emphasis is exemplified by the higher education professional and degree programs plus advanced academics for rural school districts that are the main focus of distance education efforts.

A shift in our paradigm of how we think about distance education technologies from a technological base to a student base could, in fact, provide a wide range of programming for all who can benefit rather than just those who can afford the technology.

Distance technologies can be effective in meeting the needs of the target groups through careful consideration to issues of 1) learner needs, 2) policy and 3) the pedagogy of various media.

Learner Needs

Underserved adults operate on the margins of the economy and as a result experience the stress of isolation from the mainstream of society. This isolation not only makes them reluctant to participate in traditional adult education but affects personal self esteem and dependency. Distance Education networks can address

these issues by including student support systems for tutoring, counseling, peer interaction and learning strategies. These mechanisms will determine the success or failure of participation.

Paulet and Predlas (1987), tell us that many distance education students are not self sufficient. These targeted adults are even less so as a result of their inexperience. Having been outside the system of schooling, recruitment and reentry issues become as important as retention.

The GED on TV network in Colorado offers some unique student support systems. Over 50 student centers are located around the state in a variety of locations. Each location has tailored its services to is local clientele. In a rural community college center assessment of skills prior to enrolling in the GED is completed through a self assessment process. The student receives the instrument in the mail and then calls the center for instructions on how to proceed. The results are then used to facilitate advising which is conducted in either a face to face session or over the phone. Personal contact is made and the student is eased into reentering the learning environment.

While no United States networks exist that specifically address the needs of the target groups there are GED programs and internal systems that suggest elements for adoption or adaptation. As an example, the University of Western Ontario employs peer counselors who provide information and support. They help identify strategies for learning; share experiences regarding courses; discuss problems of courses with students; pass on information regarding academic channels and contacts on the campus.

Using combinations of print, audio and video materials can be difficult for inexperienced, and beginning students (Harry, Kaye 1982) Guidance and help is often necessary. The Community Education Programme of the British Open University, which is based totally on the concept of self help, coordinates self help groups who meet at the house of one of its members. The role the group plays is that of a forum for airing problems and giving and receiving advice. Reassurance that each participant provides is essential within the process. These organized group activities permit input which reinforces and enhances the original offerings.

Policy

Policies that cater to the traditional face to face on campus students must be examined and in most cases modified. How a student registers for courses, who has access to the technology, what technology is used, where it is to be located all impact the underserved populations.

Can we use technology and distance education in humanistic ways or do we perpetuate the isolation of these groups by using technology that confines them to solitary learning? Can we use the technologies for group empowerment and dialogue or do we continue

the familiar remedial methodology and design distance learning courses based on deficiency and the banking conception?

Technology provides access to a greater range and volume of information. Questions of course content come into play. Do we continue to assume that underserved populations are not motivated learners, therefore, watered down curriculum and neutral content are acceptable? Are learners consulted in developing course content?

Partnering of resources will undoubtedly be a key component in implementing networks for basic education. One reason that such networks have been neglected to date is the high cost of course development, network design and support mechanisms that are required. Who will pay for development, for participation? While partnerships take more cooperative effort and time open broadcast systems, community based organizations sites equipped with computers, video recorders and lending library networks can put technology in the hands of the masses.

In the British Open University's Community Education Programme collaboration is a vital part of operation. Not only is there a reliance on outside funding but partnerships for identifying needs and facilitating access to national networks is important. Course materials are based on learner needs, support networks and resources are developed, and quality is monitored.

Pedagogy of the Media

Determining what technologies are used to distribute programming and learning opportunities must be chosen based on two criteria. First, what purpose is the technology to serve and second, what type of learning is to occur.

It is well documented that television is an effective media for awareness and recruitment with underserved populations, whereas, printed media is not as effective in reaching potential participants. Face to face is effective for breaking isolation and promoting socialization. Computer networking can be equally successful in keeping people connected. Telephone tutoring is effectively used in several locations offering GED. over television but would not be an appropriate mechanism for recruiting students.

Before a technology is chosen for distribution the need and objective must be identified. These then drive the selection of technology. Just because a technology is available does not make it the one that is appropriate. It is necessary to be clear about the specific function that each technology is to play. These functions include publicity awareness campaigns, recruitment, instruction, solving learning problems, providing feedback etc.

The type of learning to occur will also dictate the choice of technology. At the British Open University difficult concepts are taught using several media for both impact and redundancy.

Television programs are broadcast, videos of the programs are available and print media supports each segment. Telephone counseling reinforces learning or provides dialogue for questions.

The teaching of understanding, which requires redundancy and discussion, can be achieved by telephone conferences, face to face or interactive television. The teaching of knowledge, whether awareness or updating, can affectively be presented by television, computers or question and answer sessions of various types. Teaching of skills, which has two parts, can be a challenge. The first part of instruction and demonstration is easily facilitated through television, face to face, audio tapes or computers. The second part which consists of hands on experience can be difficult. Many skills require face to face for adequate evaluation; however, interactive television may hold some opportunities for this aspect (Sparkes, 1984).

The tight integration of print materials with television or computers supports redundancy that is so important for inexperienced learners. Rebroadcasts and video check out achieves the same result. At City Colleges of Chicago, as well as others, GED tapes are available at the public libraries for students to borrow or view on site. This type of back up supports not only the enrolled student but also those who are viewing the programs informally.

Summary

In summary, distance education technologies coupled with student support systems appropriate to the needs of underserved adults offer access to information and educational services.

While the technology is there waiting to be exploited, it is critical that targeted programming be the driving force in reaching out. Learners need to be involved in determining needs, as well as advising on specific content. It will be important to keep in mind the diversity of the underserved and therefore their needs.

Although no networks currently exist in the United States that cater to the targeted populations there are and have been ad hoc projects both here and abroad that offer components that should be examined for adaptation.

The role that media is to play in delivering of services must be determined in order to make use of the most effective means. Additionally, the type of learning that is to occur should drive the media mix employed. Factors of learner isolation and inexperience must be considered.

Designers of distance education networks can create systems that will be effective for the underserved adults of our nation.

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Live and Interactive: Is it Really Important?

Robert M. Threlkeld, California State Polytechnic University
Robert J. Behm, San Diego State University
Maureen Shiflett, College of Osteopathic Medicine, Pomona

One of the elements of distance learning which sets it apart from traditional media-based education is the concept of interaction. Distance learning professionals generally apply the term exclusively to learner-instructor communications, some (Moore, 1989, American Journal of Distance Education) believe that the term should encompass "learner-content" as well as "learner-learner" interaction. While these additional elements will help to bring theoretical order to academic distance education, practitioners are now concentrating on the need for communication between the teacher and his or her distant students. In particular, as live interactive video instruction grows throughout the county there is increasing interest in the value and necessity for instructor-student interaction.

This paper provides some additional findings about learner-instructor interaction. Drawing from a variety of research data and personal experiences, the paper offers some generalizations about this critical element of distance learning.

Distance Learning for the K-12 student
Dr. Robert Threlkeld

In a previous paper on learner support two of the present authors (Behm, Molise, and Threlkeld, 1989) suggested that adult learners and traditional K-12 students had differing needs in distance education situations. The authors found that while adults valued the logistical elements of distance learning (e.g. a good transportation system for materials), high school students placed greater emphasis on broadcast elements, such as on-air audio contact between the instructor and the students.

During the 1989-90 academic year one of the present authors (Threlkeld) conducted two studies which provide additional information concerning high school students and interaction in distance learning experiences. Results from this study provide a tentative answer to two general questions: Is the level of student interaction related to student course outcomes or attitudes? Do educational policy makers consider interaction important in deciding to employ distance learning in their organizations?

Is the level of student interaction related to student course outcomes or attitudes?

Data related to this question were taken from a larger evaluation study of high students enrolled in university credit courses transmitted via a one-way video, two-audio ITFS network. At the end of each academic quarter high school students who participate in Cal Poly's "PolyNet" program are asked to respond to a written reaction questionnaire. One of the questions asked is "How often did you interact with the instructor on the air?" Students responded using a five-point scale with choices varying between "more than once a day" to "never." Data were collected during the Fall, 1989 and Winter, 1990 quarters and collapsed into two categories, "low interactors" who claimed interaction of less than once per week, and "high interactors," who communicated with the instructor on-air one or more times per week.

Low interactors were compared to high interactors on three dimensions: academic outcome (measured by final grade), attitude toward the course (measured by responses to an attitudinal question) and feeling of inclusion in the distance learning course (measured by an attitudinal question about feeling involved in the televised class).

Comparison of High-Low Interactors (Fall, 1989)
Mean and T scores

	Low interactors (N=24)	High interactors (N=33)	T-score	Significance
Final grade	2.95	3.34	2.01	<.05
Attitude toward course	3.80	4.18	2.01	<.05
Inclusion	3.80	4.18	3.68	<.01

Comparison of High-Low Interactors (Winter, 1990)
Mean and T scores

	Low interactors (N=38)	High interactors (N=35)	T-score	Significance
Final grade[1]	2.00	2.61	1.59	NS
Attitude toward course	3.69	3.68	.04	NS
Inclusion	2.65	3.17	2.18	<.03

Although the differences between high and low interactors are not significant on all dimensions, all the differences are consistently in the same direction. Those students which describe themselves as more interactive during the live, televised classes are students who tended to perform better in the class, like the course more, and feel more a part of the class than do low interactors. While these results do not suggest causation, they do suggest interaction is highly related to those positive performance and attitudes.

Do public school administrators believe that interaction is important?

As part a state-supported educational technology project, in November, 1989, assistant superintendents for 400 school districts were surveyed about their perceived needs for distance learning in their school districts. Two hundred forty completed questionnaire were returned.

[1]Sample sizes for this question were: Low interactors (n=13), High interactors (n=16)

In a portion of the questionnaire assistant superintendents were asked to rate the importance of seven characteristics of distance education. Examples were "live, not taped instruction," and "need for a credentialed person in the viewing classroom." Of interest in the current paper, administrators were asked to rate the importance of "ability to talk with the instructor during class." Ratings were provided on a bi-polar seven-point scale (7=very important, 1=very unimportant). The average rating for all respondents was 5.9, and for those administrators who were currently using distance learning (N=75) the rating was 6.2. The ability for live on-air interaction with an instructor was the second highest rated item, surpassed only by the need for adequate library resources.

The response to this question suggest that educational administrators as a group believe that student ability to interact with instructors on-air is extremely important, and the subset of administrators currently using distance learning rate the important of student-instructor interaction as even more important.

Interaction and the Adult Learner
Dr. Robert Behm

Distant Learnings Programs at San Diego State University has conducted a number of experiments on various learner activities in the past five years.

During the Spring and Fall 1988, Spring 1989 and Fall 1989 semesters, we conducted research studies to identify the essential functions of distance education programs. In the first phase of the study, PROFNET students, faculty and support staff were interviewed by a graduate student of Educational Technology. Data gathered from the interviews was incorporated into an extensive 94-item questionnaire designed to be applicable to participants of any distance education program using any combination of delivery media. Once refined and validated, this questionnaire was administered to diverse distance student populations, providing valuable information about the critical elements needed for distance learning programs to be successful. These student populations included:

PolyNet	High school students viewing university credit anthropology and psychology courses at their schools.
PROFNET	Corporate professionals viewing engineering, computer science and business courses in small groups at their work sites.
Mainstreaming	Elementary and secondary teachers viewing graduate education courses at home via cable television.

All participants had live, talk-back capability.

Data Analysis and Results

An average score for the importance of each item on the questionnaires was calculated for each of the three groups. The items were rank-ordered from those which had the highest mean score to those with the lowest mean score. We compared the items of highest importance and lowest importance for each group. Although the groups are in statistical

agreement, important differences among the groups exist when the group responses to individual items are compared. Several items out of the 94 items on the survey were rated of most importance by one or more of the groups and of least importance by the other group or groups. Two of these items related to live class interaction. PolyNet (high school students) rated these items as most important and the PROFNET (corporate viewers) and/or Mainstreaming (teachers at home) rated these interaction as least important.

Disagreements on Importance

Most:	PolyNet
	* Students are able to interact with the instructor during the class sessions.
Most:	PolyNet
Least:	PROFNET and Mainstreaming
	* The instructor was successful in encouraging distance students to become actively involved in class discussions.
Most:	PolyNet
Least:	PROFNET
	* Instructor made distance students feel (s)he spoke directly to them.

In addition, one of the items (ability to interact with the instructor during the class) was rated most important to the PolyNet students, but was rated of average (somewhat important) importance to the adult distance education students.

Conclusion

Adults in these groups do not view interaction during class to be as important as the high school students included in this project. Although these results contradict the generally held view that, at the least, the ability to interact during class is of great importance to all distance education students, the results support the view of Phillip Swain of Purdue University. Swain reported at the 1990 NUCEA meeting in New Orleans that interaction or the ability to interact is only important if instructors are well versed in its use and the conveyance of the particular subject matter is enhanced by interactive teaching methods. The aduit students in our study agreed with his view that other forms of interaction and feedback are more important (prompt feedback on the homework and exams, good notes, etc.)

First-time Faculty Personal Perceptions of Interaction and Distance Learning
Dr. Maureen Shiflett

My first venture into interactive distance learning was in a science career orientation course for high school juniors and seniors. The course was taught over the California State Polytechnic University Distance Learning Center's PolyNet. It was offered at 7:00 a.m. and had a final enrollment of 56 students from 14 schools. There were no in-studio students. As a neophyte instructor in a distance learning format, interaction with the students only by telephone was a daunting concept. At the outset my greatest fear was that I could not coax them to interact.

In order to break that barrier, I began by assigning segments of the reading to be discussed by designated students over the air. By the end of the course, every students had such an assignment. Generally,I found that one student at a school site acted as a spokesperson over the air, but much discussion went on between the students in their high school viewing area. Often this was done with the live telephone link. I would certainly utilize this technique again, perhaps with the modification of calling on more individual students at a site, rather than allowing one spokesperson.

Unsolicited interaction was sporadic, but gratifying when it occurred. As the course progressed, it became obvious that there were a few students who asked the majority of the questions. Although the voices and style of questions were distinctive, I would usually ask who had asked the question. Late in the course, the students were given an opportunity to spend a Saturday on campus, do some activities and meet the instructors. After that the spontaneous interaction was more frequent.

As Dr. Threlkeld has indicated, most of the students seemed to think that the interactive part of the course was important to them. Almost all of the students who responded to a questionnaire answered "Agree" or "Strongly Agree" for the statements "The telephone link to the instructor was very important" and "I felt a real part of this class." Over half of the students responding marked "Strongly Agree" or "Agree" for the statements "I felt close to the professor" and "I was very involved in the class when it was going on." This corresponds to about the same number of students who marked that they personally talked to the instructor during the televised class period at least once per week.

As an instructor, it was important to me to feel that there was someone "out there." As one who uses the reactions of the students as a gauge of whether the lecture is effective, it was difficult to teach to a camera. I therefore feel that teaching over an interactive format is much more desirable to both the students and the faculty.

A counter example presents itself, however. Three schools took the course by tape. I had conference calls with those students once per week in the first half of the course. During those calls, I had the students discuss the reading and ask questions. Those students seemed to have as much interest in the course as the live-interactive students. This was manifested by the fact that students from two tape schools came to the Saturday on-campus activity. One of the schools was over 300 miles away. Thus, while one can conclude that live interaction is desirable, it is probably not necessary, as long as some personal contact is maintained between student and teacher.

ASSESSING EFFECTIVENESS OF A TWO-WAY INTERACTIVE DISTANCE LEARNING SYSTEM

Ellen J. Kabat
Janice Friedel, Ph.D.
Office of Academic Affairs and Planning
Eastern Iowa Community College District

It is the mission of the Eastern Iowa Community College District to "provide easily available educational programs and services which are responsive to personal and community needs." To this end, we believe that we must employ creative and flexible approaches to the delivery of these programs and services. The implementation of the District's Microwave Telecommunications System has greatly enhanced the realization of this belief.

The District, comprised of three comprehensive community-based colleges, is committed to the improvement and expansion of educational opportunities for the citizens of Eastern Iowa. The Televised Interactive Education (TIE) System makes feasible the district-wide offering of courses previously limited to a single campus.

The Eastern Iowa Televised Interactive Education (TIE) System links Scott Community College, Muscatine Community College and Clinton Community College. These sites are linked together by means of a two-way microwave connection. Each community college is able to produce and transmit a "live" video and audio signal from its interactive television classroom. This signal is transmitted through the air by point-to-point microwave equipment to the towers located in each community.

The TIE System creates the opportunity to offer sophomore level courses essential to the continued quality of our curriculum as well as the opportunity for those courses with historically low enrollments to be offered to a larger student population, thereby increasing the likelihood of their viability. Microwave technology also facilitates the more effective use of time and personnel through council, committee and faculty counterpart meetings on the system. Enhanced communication, information, and involvement can only lead to cooperation and unity of purpose.

Questions are consistently asked regarding the use of instructional television including cost effectiveness, the quality of instruction, and student learning via the system. Few studies have occurred regarding the instructional effectiveness of such systems, and resultant recommendations regarding effective strategies for enhancement of student learning are extremely limited.

As the state of Iowa looks to the implementation of a state-wide plan for educational telecommunications, its skeptics as well as its supporters must be assured that instructional television can assist in providing equal educational opportunities for students, and that teaching and learning are enhanced.

The Eastern Iowa Community College District's (EICCD) TIE System has been in operation since Fall 1986. In the four years that have transpired, the system has undergone technological as well as educational advances. The system was upgraded technically by the installation of a fiber optic system in 1987. This has achieved

negligible downtime. Fax machines have also been installed for ease of material transfer. Educational advances have been seen as faculty adopt the TIE system and integrate technology , for example the use of computers, with the system. The system is now also used by both a local private four year college and a major public university.

From the onset of operation, the TIE System has been informally evaluated as to its effectiveness. In the Spring of 1989, the EICCD applied for and received a grant from the FINE (First in the Nation in Education) Foundation to develop and pilot test a comprehensive evaluation model for assessing the effectiveness of a two-way interactive distance learning system.

The developed model includes six indices for determining the effectiveness of the system. These are:

System use
Enrollments
Average grade per site
Student evaluation of the system
Evaluation of students who have withdrawn from TIE courses
Instructor evaluation of the system

System use is the amount of hours the system is being utilized for courses as well as faculty, administrative and student meetings. The change in **enrollment** examines withdrawal rates of students in the TIE courses verse "regular courses." This is also compared by remote site verse origination site TIE students. Final **average grades per site** are calculated and comparisons are made between origination site verse remote site TIE students. **Student evaluation of the system** consists of written mid-term and final evaluation forms filled out by the TIE students. Questions include both technical and instructional related content. Responses are recorded on a five point Likert scale. Demographic information of the respondents is also collected. Phone interviews are conducted with students to determine why they have **withdrawn from TIE courses**. If the rationale for withdrawal is TIE related, the student is asked to further explain Finally, a written **instructor evaluation** is conducted to determine satisfaction, dissatisfaction, problems, benefits, recommendations and suggestions for staff development on the system.

This data, which will be examined biannually and compared with historic system data, has and will allow the EICCD to more easily assess the effectiveness of the TIE System.

Problems highlighted through this process can be targeted for examination.. Both student and instructor input from the evaluation process is formulated into upcoming staff development and orientation programs for the system.

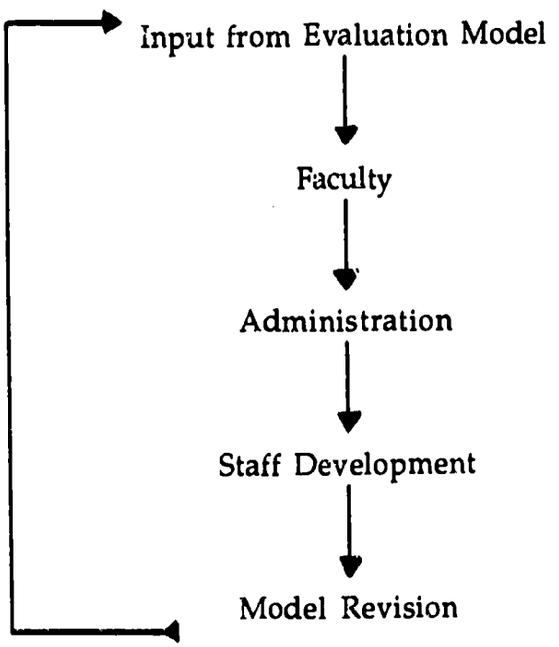
An example of this input leading to a change in procedure involved concern stated by both faculty and students in the time lag for transfer of materials from college to college. This problem has been addressed by the installation of fax machines at each college to help facilitate the ease of material transfer. Another implemented policy arose from remote site student concern for additional contact with instructors. To help resolve this concern instructors are strongly urged to originate the course from

the remote site classrooms at least once each semester. Office hours are also made available over the system for additional instruction or conference opportunities.

Suggestions for improvement are critical to maintain a dynamic and effective system of delivery. This process linked with an intensive staff development program ensure that the technologies enhance rather than interfere with instruction. Instructors are also encouraged and aided in the process of reassessing educational objectives, strategies and course materials for televised classes. EICCD faculty, as well as faculty from surrounding institutions who utilize the system, administrators, staff and all potential users of the system participate in this training. The Evaluation Model can be replicated and/or modified to meet the needs of other systems.

Quantitative and qualitative feedback from these processes aid in the effective delivery of courses. The Evaluation Model Information Feedback Loop shows the dynamics of the process.

Evaluation Model
Information Feedback Loop



To further our committment to excellence on the TIE System, the EICCD recently received funding from a Title III grant of which one activity deals with strengthening faculty skills in using telecommunications and training faculty to develop effective telecommunications courses. The EICCD is currently in the process of developing four videotapes to be used specifically for faculty orientation in this area.

It is the belief of the EICCD that the technology of the TIE System coupled with ongoing staff development and system evaluation allow for greater diversity and accessibility of our educational offerings.

CHANGING INFRASTRUCTURES

Lin J. Foa, Ph.D.
Senior Project Officer
The Annenberg/CPB Project

Introduction

Infrastructures in organizations are not as visible as those in skyscrapers, but they are considerably more dynamic. As we watch a building being built, we can see the steel girders and the concrete floors being put in place, and the wiring, plumbing, and air systems being installed. These elements are integrated in their structure and operation to allow the building to be habitable. In educational institutions, the infrastructure consists of the policies, practices and attitudes integrated by the faculty and administration to enable students to be educated. Buildings and other concrete structures exist, to be sure, but a college can move from one campus to another and still maintain its original infrastructure.

Changing the infrastructure of educational institutions is more easily said than done. The barriers to change, whether they are attitudinal or tangible, are varied and longstanding. Yet today, our concepts of student roles, faculty and teachers' roles, the independence of institutions, the coherence of disciplines, and even the physical structure and daily activities of classrooms and libraries are being questioned.

In the schools, the vocational-technical and community colleges, the four-year colleges and universities, and at the workplace, many of the traditions of the scheduling, delivery, and design of education and training have been dictated by logistics. One teacher could be seen and heard only by the number of students who could fit in the classroom; a student could physically attend only one class at a time; library books and other sources of printed information could be used only if a tangible copy, from a finite source, was available.

Over time, these structural limitations led to beliefs that became crystallized by practice. Because information was seen as a limited "good," available only to those who had "acquired" it, the faculty member was rewarded for "owning" it and then presenting it. The student's ownership of information was similarly viewed as the result of independent effort and communication solely between the teacher and the student, and thus sharing of the knowledge with other students was not encouraged, especially during tests. Even the students were regarded as entities that could be "owned," and sharing of enrollments between several institutions was not regarded favorably.

All of these organizational structures, practices, and beliefs--the infrastructure of education--are now being called into

question by the emergence of new technologies. No one is yet sure exactly where we are going, or even of all the changes that will be made along the way, but it is clear to almost everyone that the business of education will not be "as usual." The focus of this paper and the ensuing presentation at the conference will be to attempt to understand how newly emerging technologies are both responding to and driving infrastructure change -- on the classroom, institutional and statewide level. Examples of these infrastructure changes will be drawn from proposals submitted in a recent competition to the Annenberg/CPB Project.

The "New Pathways" Initiative

The Annenberg/CPB Project, in existence since 1981, seeks to fund the development of innovative uses of technologies to improve the quality and accessibility of education, and particularly post-secondary education. To accomplish this goal we have funded television courses that can be viewed on PBS -- examples include THE BRAIN, PLANET EARTH, VOICES AND VISIONS, FRENCH IN ACTION, and ETHICS IN AMERICA--and also can be taken for college credit by studying the programs and the accompanying print materials. In addition, we have funded projects that demonstrate uses of newly emerging technologies, such as hypermedia, computer conferencing, and audiographic conferencing. Besides two- and four-year colleges, high schools, businesses, and the military are regular users of our materials and our research.

As we've talked with faculty and administrators in the last few years, we've recognized that the new technologies were beginning to compel even more powerful changes in the very structure and delivery of education, especially for those students who could not attend classes on campus at traditional times -- now more than 50% of all enrollments. Thus, we developed a different type of funding initiative, "New Pathways to a Degree," to encourage as many colleges as possible to use technologies to help make beneficial shifts in the actual programs and services offered to "distant" students. The money available for planning and pilot implementation was not large--up to $150,000 for an individual institution, and up to $300,000 for consortial efforts, but the idea was to enable colleges to use the call for proposals as an impetus to focus and advance changes that were already being discussed. Accordingly, the guidelines were written with great care so that they could serve as a teaching device as well as a motivator.

Institutional Responses

In response, we received 243 proposals, representing the combined efforts of more than 400 two- and four- year colleges, businesses, associations, governing bodies, and community centers. Every state in the union but one was represented. The applicants represented a mix of public and private institutions, with a range of experience from those with a long history of delivering courses with technologies to institutions who had only

recently provided computers to administrators.

For many of the applicants, newly understood realities were the impetus for change. Again and again we read that the majority of their students were adults, and that these students were combining their educations with ongoing work and family responsibilities, resulting in a need for flexible offerings. We read that several of the applicants had surveyed their students to learn that surprisingly large percentages--often in the 35-70% range--had ready access to computers at home or work, and would be interested in taking courses delivered via computer, while more than 80% had VCRs. On a less tangible, but equally important level, colleges repeatedly acknowledged that one of the biggest barriers for these adult students was their lack of self confidence and peer support. Even more interesting, many proposals discussed these same attitudinal barriers as they related to faculty unwillingness to use the new technologies to their fullest potential in teaching.

Responses to these identified barriers were marvelously creative in a few cases, more prosaic but perhaps more easily achieved in others. Relatively few institutions had technological systems in place that could allow students to take classes, have discussions with faculty members and fellow students, take advantage of student services, and obtain on-line library resources -- all at a distance and all to the fullest extent possible. However, by combining some form of video (cassettes, ITFS, fiber optic, broadcast, etc.), and some interactive device (computer with modem, two-way video, telephone conferencing, fax, etc.), most could achieve far richer and more accessible learning opportunities for their students, however remote, than was possible in many regular classrooms. Specific examples will be described in the conference presentation, but a general description of the major types of problems and the practical changes needed can be described here.

Changing Practice

The need to increase the comfort level and the potential for hands-on practice with the technologies for both faculty and students was seen as one of the biggest problems. Accordingly, many applicants requested funding for faculty release time and additional stipends to encourage faculty to be willing to expose and correct their ignorance--an ignorance several ruefully noted was not easily acknowledged. Among the specific solutions proposed were the development of technology demonstration centers where faculty could "play" with the various technologies, faculty and student workshops, "each one teach one" programs, week-long institutes, and a variety of handbooks and manuals.

Applicants projected that once faculty and students were comfortable with the new technologies, then the inherent excitement of their potential would cause direct changes in conceptions of teaching and learning. For instance, by having to

carefully design courses well in advance due to production requirements, faculty must think through their goals, the structure of the course, and prepare materials (slides, graphics, and video clips) well in advance. "Winging it" is no longer possible, and many faculty were quoted as acknowledging how much better organized and more effective their teaching would be as a result.

At one vocational-technical school in the southeast, for example, faculty planned to use hand-held video cameras to film local applications of points being discussed, and then to insert those into the ITFS course delivery. With many systems, the ability to integrate materials from existing video, graphics tablets, videodiscs, audio tapes, and computer screens, all while the teacher is speaking live before the camera, turns the teaching process into something resembling conducting an orchestra, drawing from each the best it has to offer for the sake of the whole. Furthermore, many of the technologies offer more flexible opportunities to check whether students have mastered the materials before moving on. Thus, issues of pacing, teaching to different learning styles, and mastery learning of competencies gain new viability.

Continuing the orchestra metaphor, it becomes very clear when an instructor is examining the array of opportunities that can be used to portray or analyze an issue that the class members themselves, like the musicians, are a rich resource. Many applicants proposed a variety of ways of building on these adult students' experience and expertise by engaging them in computer conferencing, setting up telephone study groups, and developing peer critique systems for writing.

While enabling students to gain a better understanding of the subject matter and its applications, these peer contacts also help break down the most frequently discussed attitudinal barrier to success -- the adult students' lack of self confidence and need for personal support as they try to return to a process that may not have been successful for them the first time around. This need for support has been a particular problem for distant/part-time students because the inflexibility of their schedules often doesn't allow them to establish relationships in the campus coffee shops. Applicants proposed setting up electronic "study buddy" systems, moving students through ITFS-delivered degree programs as a cohort, electronic "cafes" that could allow either large-group discussions or private chats, neighborhood or tribal reservation mentors, and telephone advising hours in an effort to provide the emotional and psychological support that often makes the difference between successful completion of a program and dropping out.

Statewide Changes

On the statewide level, infrastructure changes made possible by technologies are just as apparent. Applicants indicated that

several states are being totally networked with fiber optic lines, or microwave systems, or some combination of technologies, but that institutions were on their own to figure out how to use the network once it was installed. More and more commonly, schools and colleges are realizing that these networks will allow them to share courses, enabling, for instance, rural high schools to offer courses in statistics or Japanese or other more advanced subjects where there isn't sufficient enrollment to justify hiring a teacher. Businesses can enlist their employees or offer expert commentary in these same courses in states that have been networked without anyone ever leaving the worksite.

Several applicants proposed consortial arrangements based on shared technologies that would enable not only the more standard 2 plus 2 articulation between two-year and four-year institutions, but would enable students to take entire bachelor's degree programs at the community college site, or would enable students to cross-register and have counted as resident credit courses from any of several institutions. Besides benefitting the students by making access to more specialized programs available to anyone, such reciprocal arrangements reduce wasteful duplication of programs offered within a state.

Conclusion

In conclusion, it is apparent that the infrastructures of institutional programming, policy, and attitudes that undergird our educational systems are changing dramatically. New technologies allow us to speak of "virtual" classrooms, of a professor who can interact directly with students spread over five hundred miles in a "live" discussion, of a student who can research a database and check out a book or get an article faxed from a university library with a few taps on a keyboard at home or work, and of students who can complete an assignment together even though they never meet face-to-face.

In the coming decade, we will need to reexamine exactly what it is we mean by learning and teaching, and to recognize that many traditional components of the educational infrastructure will be transformed. Throughout, we are guaranteed better results if educators around the country can share what steps they are taking into these new frontiers, so that we can each help smooth the pathway for those that follow.

WISCONSIN AT THE CROSSROADS
DISTANCE EDUCATION AND EQUALITY OF EDUCATIONAL OPPORTUNITY

Gordon Hanson
Consultant for Instructional Telecommunications
Wisconsin Department of Public Instruction

Michael Burke
Director of Instructional Resources
Green Bay Area Public School District

Ken Rogers
Director of Instruction
Cooperative Education Service Center #12

Introduction

Satellite, narrowcast and broadcast television, and microwave and fiber optics technologies transport massive amounts of voice, data and video information to the classroom, the library media center, the home and the workplace. This technology base has placed large amounts of information power in the hands of those who know how to operate these electronic systems.

The use of telecommunications technologies can help instructors be more efficient and effective by bringing the instruction to the students, regardless of whether that student is at a remote classroom across campus, in another school district, in another town, or at their place of employment. Instruction could be complete credit courses, specialized skills units and modules, on-line research and database enquiry, enrichment lessons to be added to already existing curricula, staff, administrator or employee development and inservice programs or community education or cultural enrichment programs.

Because computers and other electronic technologies are having a revolutionary effect on society, educational needs have changed and will continue to change drastically. New lifelong learning skills and technical competencies are essential to competing in the present "electronic age." As a result, schools must make significant changes in the contents of curricular areas and the number and types of curricular offerings they have in order to continue to play a major role in providing equal opportunities to all citizens they serve. Since most school districts are facing shrinking tax bases and growing numbers of staff reductions as the post-war G.I. billers retire, this involves creating a more productive classroom learning environment through the use of technology.

Instructional Technologies in Wisconsin

Because Wisconsin is a predominently rural state with 80 per cent of its school districts serving less than 2000 students, the use

of various technologies in instruction is not new. Radio, television, films and film strips, and audio tapes and cassettes have been used for a long time by schools for instruction, drill and practice, and supplemental teacher activities. Instruction in such areas as art, music appreciation, and science has been part of the University of Wisconsin-Extension's (UW-EX) Wisconsin School of the Air program since the mid 1930s. Most of these technologies were integral components of the individually guided instruction classrooms of the late 1960s-early 1970s.

Two-way interactive technologies are also not new. Since 1965 the UW-EX has been providing instruction via the Educational Teleconferencing Network (ETN), a two-way audio communications network which links 200 locations statewide and offers over 300 course series annually. But the recent explosion in video, voice and data telecommunications technologies has provided school districts with a veritable shopping list of choices. Interactive cable television is being used by eight school districts in the Trempealeau County's Project CIRCUIT and by three school districts in the Milwaukee area to teach Japanese. Other school districts use the state instructional television broadcast network for instructional television programs while four CESA-run private telephone networks (CTNs) provide two-way audio credit courses and enrichment programs for students, staff development programs for the schools and community education programs for all citizens. Eight instructional television fixed service (ITFS) systems operate the same type of courses and programs in a one-way video, two-way audio mode. Approximately 21 school districts take direct instruction and staff development programs from satellite television providers while another 50 downlink enrichment programs with their own satellite dish. Many school districts in the state conduct database searches via computer and modem.

Assessing Wisconsin's Distance Education Needs

In the absence of a statewide telecommunications system, a needs assessment was conducted to assist local and regional education units decide which technologies would meet their educational needs cost effectively.

In 1987 the Wisconsin Department of Public Instruction (DPI) with the Educational Communications Board (ECB) and Cooperative Education Service Agency (CESA) #10 designed a process to identify the distance education programming needs of school districts in a CESA.

These needs were identified by first gathering needs statements from each school district participating in the assessment. All districts used the same survey instrument to structure the analysis. In addition to instructional needs, school districts were to identify their staff development, inservice, and community and adult education needs, and to identify the staff expertise each could share with neighboring districts or other

districts in the CESA.

This assessment process identified several statewide needs:

- o the three most frequently mentioned instructional course needs are foreign languages, programming for gifted and talented students, and advanced placement math and science courses -- other frequently mentioned course needs were vocational courses such as agriculture, technology and career education, and education for employment; at-risk programs such as AODA, gray-area, ESL and third-grade remediation; and science and math enrichment programs covering calculus, computer sciences and electronics;

- o every region of the state indicated the need to provide low-enrollment courses and courses that meet the requirements for the state mandated 20 Minimal Education and Graduation Standards;

- o staff development needs tended to address the upgrading of teachers' classroom skills and instructional aids, especially in the use of computers and new technologies, and the need to understand and deal effectively with all special student populations, especially gifted and talented, at-risk, EEN and gray area students;

- o every region of the state indicated that there was sufficient sharable in-district staff expertise available to meet almost every content area and program need identified in the survey, indicating that what is lacking is a technology or system to deliver these local resources to the neighboring districts that could use them;

- o every region of the state identified the need for help in coordinating planning, services, programming, equipment, usage rights, and information.

Two projects who participated in this assessment designed telecommunications systems to meet their educational needs.

Green Bay's IFTS Consortium

The Green Bay Area Public School District, in cooperation with the ECB, operates an ITFS system to school districts in northeastern Wisconsin. This system is designed to handle all four methods of instructional delivery: print, audio, video and computer.

School district ITFS staff began working with their CESA in the spring of 1988 to form a consortium of 17 school districts housing 32 receive sites serving approximately 2,500 teachers and more than 36,000 students. The consortium, called the Northeast Wisconsin Telecommunications Education Consortium (NEWTEC), is governed by a board of seven school superintendents and an

advisory committee consisting of a representative from each member district which makes programming and fiscal management recommendations to the board.

In January, 1989, NEWTEC began broadcasting instructional television programs. Programming during this first semester consisted of live programming from their own studio, the rebroadcast of prerecorded programs, and live satellite teleconferences and programs. Live programming began in the morning with an early bird advanced placement calculus class at 7:00 am and usually concluded at 6:15 pm with the end of the staff development program.

The advanced placement calculus course was broadcast to 22 high school students in six school districts surrounding Green Bay. Students in these rural districts, who would not have otherwise been able to take this subject due to low-enrollments in their schools, were able to take calculus for credit without leaving their schools or missing other course offerings. Students worked with the receive site facilitators at each school who set up equipment, notified staff and students of programming, kept attendance records, supervised testing, and provided the communication link between the studio teacher and the students.

During the 1989-90 school year, NEWTEC expanded its student enrichment programs and added a second ITFS channel because five of the consortium schools were selected to participate in the Satellite Educational Resources Consortium (SERC) demonstration project. Russian I, Japanese I, economics, and science, technology and society seminars along with 37 hours of staff development programming were taken by these five school districts.

Staff development programs for all members were offered live immediately after the school day two or three nights weekly throughout the semester. These programs allowed staff to remain in their buildings to participate in the interactive television programs. Topics covered included "Emergent Literacy Development," "Programming for the Gifted and Talented," "Cooperative Learning," "Teaching Skillful Thinking," and a series of programs for special education teachers sponcored by the CESA.

Additional sources of programming on the system was prerecorded video programs, such as National Geographic videos, PBS programs, NASA teleconferences, Assignment Discovery from the Discovery cable channel, CNN Newsroom, and C-Span programs which provided a wide variety of enrichment opportunities for elementary and secondary students in the consortium, and live interactive staff development programs which were received via NEWTEC's satellite dish and rebroadcast to receive sites over the ITFS system. National sources of staff development programming included Oklahoma State University, SERC, NASA, NUTN and other satellite transmission networks.

The Northern Wisconsin Educational Communications System

A broad group of educational institutions organized to form the Northern Wisconsin Educational Communications System. The purpose of this system is to increase options for learning and to access educational opportunities for all residents within the boundaries of the member districts by facilitating cooperation and coordination among school districts and post-secondary institutions. To accomplish this the consortium is developing a fiber-optic network with the capacity to carry two-way interactive, full motion video and audio channels, data transfer, facsimile, and telephone conversations. The network will extend 548 miles to approximately 45 educational sites in a 10 county area in northwestern Wisconsin, Minnesota and upper Michigan. Currently there is no fiber in this area to facilitate a network such as the one planned. The consortium consists of the five campuses of the Wisconsin Indianhead Technical College, CESA #12, Superior Public School District, University of Wisconsin-Superior, and 18 small, rural public school districts. Private educational institutions planning to be part of the network include Northland College, Lac Courte Orielles Community College and the Lac Courte Orielles K-12 Indian school.

This network is intended to serve as a model of cooperation for the state of Wisconsin. It is intended to bring all levels of educational support, from technical college and university courses to elementary and secondary credit courses, to the predominently poor, rural communities it serves, including the major American Indian population in this state. Although primarily a fiber optic network, this system will also incorporate technologies such as microwave, satellite downlinks, slowscan on existing copper wires, and broadcast television.

The consortium conducted a comprehensive distance learning study based on educational needs of the K-12 schools and the technical college and university campuses. The top five needs for the K-12 school districts were language instruction, science and technology, at-risk students, and technology and systems utilization.

Since this network covers a large area of land in the northern reaches of the state, higher education members identified outreach as the primary reason for their participation. The vocational college identified its two prorities as the capability to conduct high speed data communications between its five satellite campuses and the ability to maximize and equalize credit course offerings between all of its campuses and any other school along the fiber route. The university campus identified the need to offer credit courses to K-12 teachers in its service region and the general public along the fiber route, especially those living on the reservations, as its basic reason for participating in this consortium.

SUCCESSFUL SATELLITE RECEIVING SYSTEM STARTUP FOR YOUR SITE

by

John W. Robinson

Motorola University

Once installed and operating, satellite receiving equipment is usually quite reliable and delivers a consistently good quality video and audio better than 99% of the time. Potential users are usually apprehensive about the installation and operation. There seems to be a universally held belief that there is more art than science in planning and installing a good satellite receiving system. The converse is really the case. The results of several thousands of installations should tell even the least technical, potential user that they too can achieve success. Then why are people worried?

The reasons for concern and worry are real. We cannot just dispatch them by saying, "Don't worry about it!" What the potential user needs to do is really quite simple.

THE CRITICAL STEPS

1. Read and research the subject in various publications (see Appendix) It is important to learn the lingo of the business so you may converse intelligently with suppliers and installers. If you will be a National Technological University (NTU) (telephone 303-484-6050) user, order their site coordinator's handbook. It has a good section on system startup. Read and study it.

2. Find several other TVRO users in your area. Call them on the phone and have them tell you how they went about the process. Then visit 2 or 3 to ascertain what worked as planned and what did not. Pay especially close attention to the placement of their antenna, equipment cabling, and availability of electric power. Some communities have strict ordinances concerning satellite antennas. There are a few that even require a potential user to prove they cannot use the cable TV system before a permit will be

granted for a private antenna.

3. Call your potential satellite program supplier(s) and find out what satellite(s) they use, what receiving equipment is recommended, and do they have a list of recommended suppliers.

4. Call several of the equipment suppliers you have discovered. Describe what you need to do and ask them to visit your site so they can examine it with you. Ask them to come and visit your site. Generally, the manufacturer or a manufacturer's representative will come to visit. Their purpose is to solict your business. Your purpose is to learn as much as you can about their equipment, systems, and the satellite business in general. Be sure to ask them for references.

IMPORTANT QUESTIONS AND ANSWERS

Also ask them, "In your experience, where do most users encounter problems." If they are direct and honest with you they will cite such problems as:

- "Some users don't want to pay for an antenna of sufficient size. When they get weak signals they wonder why the picture quality is poor." For example, at Motorola's - NTU TVRO sites we only recommend antennas of 4.5 meters or larger to insure good quality pictures and sound. Earlier we made the mistake of installing the smaller 3.7 meter antennas. Whenever there is heavy snow or rain we can count on maintenance calls.

- "Some users want to place their antenna on the roof for security and convenience. All antennas, except the 1 meter size, should be ground mounted for stability and reliability. Frequently, the cost to prepare the roof mount is more costly than the antenna itself."

- "Some users will try to avoid the expense of de-icing by sending someone from the maintenance department outside in a snow-

storm to clear snow and ice off of the antenna with a broom. This solution usually yields inconsistent results." If you are in the snow belt, buy de-icing equipment.

Once you have completed your basic research and interviewed several users, programmers, and suppliers, you are ready to plan your own system.

PLANNING YOUR OWN SITE

- Location(s) Are there several viewing sites in one building? If so, you should consider multiple TV monitors.
- Number of people per site.

  Don't try to have too many people per monitor, especially if the program will present technical information with numbers to be displayed. The person in the last row should be able to read the smallest numbers on the TV monitor screen.
- Programming
  - How many services do you need to receive?
  - Internally generated, NTU, NUTN, PBS narrowcast etc.?
  - Will users watch live, taped, or both?
  - If the programs will be taped, you will need a tape library and a provision for storing the recorded tapes and checking them out and back in. Do not assume everyone will return the tapes. Good intentions being what they are, many tapes will end up being stored in someone's family room video collection in perpetuity unless they have to be checked back in.
- Copyright Considerations.

  If you are taping programs, be certain you have received copying permission from the program supplier. Some people will assume the received material allows the receiver to copy the broadcast in a manner similar to regular broadcast TV. This may or may not be true. Some program suppliers have done follow up checks to insure receiving sites are abiding by their copying and copyright rules. This is one case where asking foregiveness later does not work. A guideline some sites have used is to follow the policy established by

the M.I.S. Department on software security and copying. In other words, ask permission first.

- Pre-mailed support material is utilized in many programs. Make certain your receiving sites have ordered the material in advance.
- Audience call-ins are encouraged as an integral portion of some programs or courses. Be certain a telephone is placed in the viewing room for those occasions. You also need to plan for unauthorized use during non-program hours. One approach is to arrange a special access code with your telecommunications department for long distance use. Otherwise you may be surprised by "midnight callers" checking on the Honolulu weather or soccer scores in Rome.
- Equipment and Systems Considerations are too complex to review here in detail. However, all systems have the following items in one form or another. You should try to understand their function before you request quotations to insure you will receive what you expect:

  - Antenna and mount. You will need to order either:
    - A fixed azimuth* antenna system to receive one satellite or,
    - A repositionable antenna system so you may readjust the azimuth to receive different satellites.

      * The azimuth is the direction the antenna is pointed to receive a specific satellite.
  - Receivers - one required for each channel you expect to receive.
  - Equipment racks so the receivers and other equipment may be mounted in an orderly way.
  - TV monitors - one required for each program channel you expect to receive. Don't forget to order extra monitors for viewers who may wish to view a recorded tape after reception.
  - Cabling to connect the various items of equipment together.
  - A telephone in the equipment room for use during system adjustment and trouble shooting.
  - VCR's, usually at least one should be installed in the equipment room for monitoring of live programs as they are received.

- Installation

Systems that perform reliably are always carefull planned and installed. You may rely upon the equipment supplier for installation, or you may contract with an independent installer. You should discuss the following with the person rersponsible for installation:

- Positioning of the antenna, cables, fences, shrubbery, etc. to meet your own organization's standards for facilities.
- How will the crews and trucks get to the site? On roads, over the lawn?
- Will the installation contractor do the work or will it b subcontracted?
- Who will repair any landscape or lawn damage? At whose expense?
- The installer should adjust and optimize the equipment. Ask for a copy of their installation standards and review it with your facilities department and another experienced user.
- How much systems training will the installer provide for your staff? Ask them to be be specific. Do they have a training program? Get a copy in advance.
- If building permits are required who will secure them? Better discuss with your facilities department well in advance of installation. Sometimes zoning approval takes months. A zoning variation can take the better part of a year.

SUMMARY

If you carefully follow these steps, and add any you discover on your own, you should be just as successful as thousands have before you.

APPENDIX

Addresses of Satellite Television Publications

"Business TV and Video Guide"
Telespan Publishing Company
P.O. Box 6250
Altadena, Ca. 91001
Telephone 818 - 797- 5482

Subscription - free to qualified readers on company letterhead.

"Satellite Communications"
Cardiff Publishing Company
Suite 650
6300 S. Syracuse Way
Englewood, Co. 80111
Telephone 303-220-0600

Subscription - $26.00 per year

"Via Satellite"
Phillips Publishing Inc.
7811 Montrose Rd.
Rockville, Md. 20850

Telephone 301-340-2100

Subscription - Free to qualified recipients

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HELPING ADULTS LEARN: Improving Teacher/Tutor Performance in Literacy and Basic Education

Dehra W. Shafer
Center for Instructional Design and Interactive Video
WPSX-TV, Penn State

Introduction

The HELPING ADULTS LEARN videotape series addresses the ongoing need for in-service training among literacy and basic education teachers and tutors. This paper presents why and how the training series was developed to meet that need. It will also explain the in-service use of the series via The PENNARAMA Channel, Pennsylvania's Network, a 24-hour-a-day educational cable television service, and the series availability nation-wide.

The Problem

The need for effective in-service training of literacy tutors and adult basic education and general educational development teachers is ongoing, due in part to the relatively high turnover of tutors and to the fact that many teachers are employed part-time. In particular, many teachers come from a background in primary and secondary education and have little or no prior experience with adult learners. Experienced teachers of adults know that their work often extends well beyond the teaching of cognitive information; often, it involves such things as personal counseling and building the adult's self-esteem. The individual teacher's ability to adapt and respond to the particular needs of adult students is, in the final analysis, critical to the teacher's success as a teacher and to the eventual success of the adult student. Given these circumstances, there is a vital need for local literacy and adult basic education programs to have available to them resources that can be used to orient new teachers. These resources should be useful by individual teachers or by small groups, and they should be re-usable, so that they can be implemented whenever new teachers and tutors come into a program.

HELPING ADULTS LEARN: A Response to the Problem

The HELPING ADULTS LEARN videotape series responds to this problem through a combination of video and print materials. The role of video is twofold. First, video provides an opportunity for teachers to learn from experiences of other teachers, tutors, program administrators, academics, and, perhaps most important, the adult students themselves. Through video, abstract concepts about adult learners can be made specific and human. Second, video cassettes are easily stored at local adult education program sites and can be used whenever a new teacher joins the staff or a new tutor is trained. In-service training can be conducted at any time, even before a new tutor or teacher meets his or her first student or class. Instructional user guides focus the viewer on key issues raised during the programs, provide questions for discussion or individual consideration, and point the viewer to additional resources.

The six part series and instructional user guides provide an orientation to the unique characteristics of adult learners, illustrate effective ways to communicate and counsel students, show examples of how students' needs and experiences can be used as instructional resources, and feature the newest approach to literacy through intergenerational programs. The titles in the series are as follows:

WHO ARE YOUR STUDENTS?

Those who teach adult basic education need to understand the psychological, sociological, and cultural differences of the men and women whom they will be teaching. Underlying the education process, at all age levels, is the need for teachers and tutors to know their students--their capacities, backgrounds, motivations, and personal characteristics. Without such knowledge, even the most competent teacher or tutor cannot expect to be successful. The first program in the series explores the characteristics of adult learners, their motivations, the barriers that they face in receiving an education, and the challenges and opportunities that their characteristics present to teachers.

COMMUNICATING WITH YOUR STUDENTS

Research indicates that a basic problem of communication with under-educated people lies in the types of messages or content presented. If a message is presented in the context of an "alien" environment, one which has no relevance to the immediate needs of the student, it often will be rejected. If the message is preceded by a study of the student's needs, then the objectives of a lesson can be more easily achieved. The second program in the series discusses how communication (from how a lesson is presented to the personal relationship between teacher and student) assumes new importance in the adult classroom. It also examines specific communication techniques needed to reach adult learners

COUNSELING FOR ADULT LEARNERS

Under-educated adults, because of their frequent lack of self-confidence, low socioeconomic background, and employment problems, have great need for counseling of various kinds. Counseling begins when adult students enter a classroom or tutoring session and continues throughout their educational experience. Whether or not an education service provider has guidance specialists, it is the teacher or tutor, the one who works with a student on a regular basis, who is most likely to inspire his or her confidence and make it possible for that person to open up and describe his or her feelings, needs, hopes, ambitions, and personal problems. Therefore, teachers and tutors become the key people in helping adult learners achieve their goals. The third program in the series discusses how adult learners often bring personal problems to learning sessions, and how their concerns can present a serious block to learning unless the teacher knows how to counsel adult students and use their problems as building blocks for instruction.

LANGUAGE EXPERIENCE APPROACH

After years of failure and frustration, beginning adult readers typically regard printed material as threatening and alien. However, they bring to a learning situation lifetimes of rich and varied experiences. Teachers and tutors can draw from this wealth of knowledge by using the language experience approach to teaching reading. The language experience approach helps to overcome "print blockage" by using the adult's oral language ability to develop meaningful, nonthreatening reading material created by the learner. In addition, the approach creates a cooperative learning atmosphere by allowing the student to share experiences, interests, and attitudes. The fourth program in the series is an in-depth analysis of this method of teaching reading. The program demonstrates the method in both a tutoring and a group learning environment, and it incorporates interviews with teachers and adult learners.

STUDENTS' NEEDS: AN INSTRUCTIONAL RESOURCE

Adults who return to an educational setting--whether a literacy, basic education, general educational development, job training, or continuing education program--are seeking to fulfill one or more needs. Too often, however, returning adult students become quickly disillusioned by programs which are irrelevant or fail to accommodate their search for fulfillment of their needs. They either lose interest and motivation or leave the program altogether. It is imperative, then, that the individual needs and concerns of adults be addressed when they enter a program. Meeting such needs implies a flexible and constantly evolving curriculum. The fifth program in the series demonstrates a variety of methods that tutors and teachers can employ to incorporate the adult student's day-to-day needs into a curriculum. Students discuss their motivations for continuing their education, and teachers describe how they educate the students in ways that are both interesting and relevant.

FAMILY LITERACY: THE LEARNING TRIANGLE

Family literacy refers to behaviors and attitudes cycling from generation to generation, which means, for example, that parents who dropped out of school are more likely to have children who drop out of school. Parents are the primary role models for children, and children often follow family patterns of low educational achievement and subsequent underemployment. Children need successful examples to imitate, and family literacy intervention helps to create positive parental role modeling. Research shows, in fact, that the strongest predictor of a child's success rate in school is the educational attainment of his or her mother. The cyclical dynamics of poverty and illiteracy therefore demand that adult literacy programs address the educational needs of both parents and children. The newest program in this series illustrates essential aspects of family literacy programs, features four, innovative, Pennsylvania family literacy programs, and makes recommendations for successful program implementation.

In-Service Training via The PENNARAMA Channel

In Pennsylvania, literacy and basic education service providers have the opportunity to offer in-service training to their teachers and tutors via The PENNARAMA Channel, Pennsylvania's Network. PENNARAMA is a unique, educational cable television service for Pennsylvania. Its primary purpose is to provide learning opportunities to part-time adult students via cable television. Courses are for degree-seeking adult students, for adults who seek learning for personal enrichment, and for adults who need continuing education from basic skills instruction to occupational and professional pursuits. The courses use audio-visual and print materials that make it possible for adults to study independently.

Every week, PENNARAMA offers a full schedule of instructional television lessons to cable television subscribers. Each lesson is repeated several times each day and several days per week to allow students to select viewing times convenient to their individual schedules. Lessons may be viewed at home, at work, or in a community setting.

Through the Pennsylvania Educational Communications Systems (PECS), cable operators finance, construct, and maintain the technical facilities that are needed and provide channel space for PENNARAMA. Through the PENNARAMA service distributed by PECS, the cable television industry in Pennsylvania expresses a commitment to education. PENNARAMA is managed by Penn State through an agreement with PECS.

The HELPING ADULTS LEARN videotape series was designed and produced by the Center for Instructional Design and Interactive Video (WPSX-TV) as a continuing education and community service of Penn State's College of Education. The project was supported by the U.S. Department of Education and the Pennsylvania Department of Education. Copies of the videotapes and instructional user guides are available in Pennsylvania from ADVANCE, the PDE Resource Center, 1-800-992-2283. Outside of Pennsylvania copies are available from Penn State Audio-Visual Services, 1-814-865-6314.

COMPUTER NETWORK ENVIRONMENT FOR DISTANCE EDUCATION

Lucie Rivard. Responsable du Bureau de télématique, Télé-université, Université du Québec, Ste-Foy, Québec.

INTRODUCTION

Our aim in today's presentation is to give you a clearer, more dynamic picture of the elements essential to the implementation of computer network environment at Télé-université.

We will first introduce the model adopted by Télé-université, its design, production and implementation. We will also introduce those issues which must be explored before computer network applications for distance education may be set up. The success indicators will be grouped into four rubrics: media and ergonomic approaches to computer network applications, guidance planning, and technological planning

1. COMPUTER NETWORK ENVIRONMENT FOR DISTANCE EDUCATION

Télé-université has pioneered the use of computer network environment (telematics) within an educational framework in Quebec. Telematics, as it was said by Nora and Minc in 1978, is the imbrication of computer sciences, television, telephone and telecommunications. Nora and Minc certified that telematics will not be another ordinary network but one of another nature. In this kind of network, images sound and memories will be involved. Telematics will contribute to the transformation of the cultural models. (Hansel, p. 87)

From 1977 to the present day, our objectives and approaches have been constant; the technology, however, has evolved. Technological advances within information industries show two major tendencies : the first has been to expand the potential of telematic communication, making it more and more natural, visual and intuitive; the second has been to allow the user to navigate within large multi-media data bases in real time.

In order to respond to these two major tendencies - greater naturalness in space and time - institutions offering distance education must extend the limits of the traditional campus; they must expand it in terms of space and time. Telematics has an essential role to play in meeting the challenge of this expansion. As Feenberg (1988) notes, telematics puts an end to one-way transmission and opens communication lines between students and teachers.

The use of telematics does, however, impose strong constraints on the structuring of the information to be transmitted. A telematic application which includes electronic mail, computer-based conferencing, animated simulations, text data bases and documentary research facilities necessarily implies restructuring the modes of information searches, and of student guidance as well. Setting up such a application also requires well-coordinated teamwork in order to avoid major design, editing, guidance and implementation problems.

2. THE CONTRIBUTION OF SPECIALISTS

2.1 Conception

The professor at Télé-université is generally a content specialist, who produces a course in conjunction with a project director. The professor has a profile of the students interested in the subject matter of a given course, and knowledge of their needs. The professor is also assisted in this task by teams specializing in course design, production and student guidance.

2.2 Editing

Editing the content in the computer network environment does not consist of computerizing a mass of raw data, but rather of making the information content meaningful. The process of editing in the Bureau de télématique calls on analysts to process images, propose development scenarios, improve the interactive aspect of the products to be marketed and do research to ensure the quality of the user interface. A graphic artist joins the team and serves as a consultant for the screen content layout. When the project is in the advanced stages of analysis, the computer technicians of the Bureau de télématique join the team.

2.3 Guidance

In order to produce a course designed on telematic media, whether in print or in audio-visual form, the professor and the educational technologist must collaborate with a guidance specialist. Together they establish the type of framework to be used, determine the selection criteria for tutors, and ensure their training. The applications researched and developed by the various specialists involved in setting up a university-level telematic service fall into two groups. These are presented in the following section.

3. THE TWO GROUPS OF TELEMATIC APPLICATIONS DEVELOPED AT TELE-UNIVERSITE

We have divided the telematic applications used in distance education into two groups, those applications meeting communications and guidance needs, and those meeting the pedagogical and didactic needs.

GROUP 1 : COMMUNICATION AND GUIDANCE

Interpersonal and intergroup communication needs are usually met by electronic mail links, by computer-based conferencing and by telematic conversation : information sources are thus diversified. This type of communication can have an informal tone. It is flexible, allowing for variation between courses and between groups. Communications are thus structured according to specific interventions and particular needs.

Telematic guidance of students and tutors is accomplished mainly through the use of computer conference programs and electronic mail links. Wider applications – program and file downloading, monitoring and referring to academic files, etc. – can be added as needed.

GROUP 2 : SUBJECT MATTER

It is also worth noting that telematic applications developed or used for the "teledistribution" of interactive subject matter differ mainly in the structure, management and consulting of the information transmitted. Information to be formatted for telematic purposes is edited according to page formating and ease of navigation constraints, which aim to improve user interface. We must deal therefore on the one hand with the dynamic aspect of the applications, and on the other with issues such as the ergonomic aspects of the computer programs.

4. CRITERIA OF SUCCESS IN TELEMATICS

Before they approach the media aspects of communication, the members of the team planning a course using telematic media must address basic questions.

A sound preliminary analysis allows both the establishment of work loads within a specific project, and an overall plan for computer applications. Specialists are better able to integrate their work into the overall project, and economies of scale are generated. In telematics, as in computer work generally, it is the effort invested in systems analysis and in user interface which is crucial.

4.1 Media and ergonomic approaches to communication

At Télé-université, the designing of the user interface concerns the professor, the designer of subject matter, the educational technologist, the telematics expert (analyst), the graphics designer and the computer technician alike. The user interface design comprises both navigation strategies and the design of screen-display.

4.1.1 Navigation strategies

Navigating is an interactive process. Interactivity is the main characteristic of the dialogue with the telematic system. The dialogue can vary from low to high interactivity, depending on the types of intervention allowed. Intervention is voluntary: it means to influence the flow of events (Rabaté and Rotenberg, 1985).

The type of intervention allowed depends upon a combination of elements involved in telematic communication: the micro-computer or terminal (Alex, for instance); the communications software; the network; the specific applications or services; and the server itself. It is among these elements that the user is said to be navigating.

4.1.2 Screen format design

The telematics expert (analyst), the computer technician and the design and editing teams work in accordance with the layout constraints of a given telematic system. At this level each of these is concerned with the different styslistic and linguistic aspects of production.

4.2 Telematic guidance planning

Two distinct types of aims must be considered when planning a telematic framework : those of the pedagogy and those of the institution. In the case of distance education, telematic guidance must be planned in the early stages of production.

4.3 Technological planning

Technological planning of the proposed telematic system is done with the student-users in mind. Several factors ensure the value of telematic consultations:

It would be logical to conclude the technological planning phase only after the data on the needs of students and institutional constraints has been obtained. In practice, however, it is often difficult to do so.

CONCLUSION

We cannot say for certain what shape telematics will take at Télé-université in days to come. We expect, however, that heterogeneity of systems will continue through the '90s. We will have to keep adapting our telematic design to new terminals such as Alex and Minitel, as well as to IBM-compatibles and Macintosh equipment. We expect too that further interface software will come onto the market which will increase the efficiency of the analysts and technicians designing telematic systems.

We believe that excellence in the navigation and editing strategies for telematic applications is within our reach. As well, we envisage multimedia integrated learning environments which would utilise sound, images and colour graphics.

It is a story to be continued, and one well worth following...

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THE EFFECT OF DELIVERY SYSTEMS ON SELECTED EDUCATIONAL OUTCOMES AMONG NONTRADITIONAL STUDENTS IN AN UNDERGRADUATE BUSINESS ADMINISTRATION DEGREE PROGRAM

Judith Edison Paul, Ph.D.
Department of Business Administration
University of Wisconsin-Platteville

Introduction

Nontraditional learners in higher education are increasing in number. As the demand for nontraditional learning opportunity increases, delivery systems used to provide nontraditional learning opportunities seem to call for greater study. Some of the factors effecting the educational outcomes of a delivery system are student progress rate, satisfaction, and achievement.

Research Problem-Procedures

The problem addressed by this study was to determine whether or not learning outcomes of progress rate, satisfaction, and achievement differ significantly when three nontraditional delivery systems used to deliver a marketing course in higher education to nontraditional learners are compared.

The population of the study included students completing Introduction to Marketing at a medium-sized midwestern university via one of three delivery systems; in-house corporate classes at a corporation 40 miles from the university, extended day classes on the university campus, and Extended Degree Program students studying independently.

Data were collected through a mailed survey instrument designed for the study. The questionnaire was mailed to 179 students, all having completed an Introduction to Marketing course between June of 1986 and June of 1989. One hundred and fifty-nine students responded to the survey providing an 89 percent return rate for the study. A university academic computing service was used to input the data, and statistical calculations were derived using the minitab software package.

Size of the delivery system groups varied. There were 68 possible corporate respondents, 58 of whom responded; 24 possible extended day respondents, 21 of whom responded; and 87 possible EDP respondents, 80 of whom responded. The highest response rate was among the EDP students with a 92 percent return; extended day students returned surveys at an 87.5 percent rate; and corporate students returned the survey at an 85 percent rate.

Information obtained through the survey instrument included data on selected demographic variables and outcomes of progress rate, satisfaction and achievement.

The instrument used in the study was a 22-question survey instrument designed for this study. A pilot study was conducted when developing the questionnaire, with 79 percent of the pilot population responding. The survey instrument uses a multiple-choice format. The instrument was evaluated for validity and reliability.

The entire sample of 179 students was sent the questionnaire on October 10, 1989. After one month, nonrespondents were called and given until December 24, 1989, to respond.

Objectives of the study included a description of student demographics and the testing of the following three hypotheses:

H_{o1} - There is no significant difference in the progress rate among students enrolled in extended day, in-house corporate, and independent study modes.

H_{o2} - There is no significant difference in the level of satisfaction among students enrolled in extended day, in-house corporate, and independent study modes.

H_{o3} - There is no significant difference in the level of achievement among students enrolled in extended day, in-house corporate, and independent study modes.

Limitations

This study has four major limitations affecting the student population and course delivery systems being investigated.

1. The study was limited to nontraditional students completing an Introduction to Marketing course from June 1, 1986, to June 1, 1989.

2. The investigation focused on how the course delivery system impacts on student progress rate, student satisfaction, and student achievement.

3. Three delivery systems were investigated: extended day classes, in-house corporate classes, and independent study through the Extended Degree Program, an external degree program offered through the Business Administration Department of a medium-sized midwestern university and taught by campus faculty.

4. Persisters in the three delivery systems under investigation comprised the study sample.

In brief, the sample consists only of nontraditional students completing Introduction to Marketing as a credit course as it is offered in the Business Administration degree program at a medium-sized midwestern university from June 1, 1986, to June 1, 1989.

The study does not attempt to include a direct measure of instructor effort, variability among instructors, learner motivation, or learning style.

The textbook and basic course materials are the same for all three delivery systems. Faculty members teaching in all three delivery systems are the same.

Analysis

Once the data were collected, descriptive statistics were used to summarize the findings; ANOVA analysis was used to determine variance among groups; and pairwise means tests using the t statistic were employed to further compare delivery systems. Chi-Square analysis of selected survey items were done to enrich the findings.

Findings

The findings allowed for the rejection of the first two hypotheses which stated that delivery system did not impact on progress rate and satisfaction. The hypothesis stating that delivery system did not impact on achievement was accepted.

Conclusions Related to Hypotheses

1. Progress rate paralleled the expectations of the delivery system in which students were enrolled. Although explanations for this finding remain somewhat tentative, indications are that students tend to select the specific delivery system based on their respective needs.

2. In particular, students seem more satisfied with delivery systems which match their needs in terms of convenience, location and pacing preferences. For example, those students with jobs seem to experience a high level of satisfaction with delivery systems that offer nontraditional locations or independent study opportunities.

3. Achievement does not seem to vary notably with delivery system, indicating that students may learn equally well through a variety of delivery systems. What we do not know, however, is the extent to which comparable time, effort, and resources were expended by students in each of the three systems in attaining comparable levels of achievement. This should help validate the efforts of institutions to create alternative delivery systems as they strive to serve student needs without compromising quality.

Conclusions Related to Delivery System

Corporate Delivery System

1. Although students at the corporate site received the fewest A's and B's, 95 percent were satisfied with their grade. The corporate group also had the highest percent of students

indicating that the course contributed to their work in the job setting, and over half felt that it helped in other ways.

2. Students in the corporate setting had completed fewest previous credits with over half having completed fewer than five previous courses. Almost three-fourths (72%) had only a high school diploma compared to half as many with a high school diploma in the other two delivery systems. The smallest percent of students planned to work toward a degree in the corporate setting, possibly because of their involvement with their jobs and their lack of prior academic experience.

3. The majority of the corporate students lived from 11 to 50 miles from the university town. There was a normal distribution of age ranges. Everyone in the corporate setting was employed at least part-time. Over 90 percent were reimbursed, at least partially, by their employer. Given the corporation's policy, the other 10 percent probably could have been reimbursed.

4. Corporate students were the most satisfied with their delivery system, hence, the conclusion that they greatly appreciated courses being delivered at the corporate site. They also had the lowest level of experience with that type of delivery system, although they found it very convenient. Ninety percent said that they would enroll in other courses using the same delivery system.

5. None of these students indicated a willingness to attend a day class if the corporate delivery system were not available, leading to the conclusion that a market was served which otherwise would not be accommodated.

Extended Day Delivery System

1. About one-third of these students lived in the university town, and 80 percent lived within 50 miles of the campus. Seventy-five percent of the students were employed at least part-time, but only five percent received employer assistance with tuition.

2. This group seemed to experience the highest levels of dissatisfaction with about 10 percent being dissatisfied with the delivery system, student/instructor relationship, and learning activities. There was a wide range of opinion among students in this group. Only 33 percent indicated that the delivery system was convenient, although 95 percent had prior experience with it.

3. Over half of the extended day students said that they would take the course during the day if it had not been offered in the extended day system, indicating an overlap in the market reached by this system. Only 75 percent of the students were happy with their grade, and 20 percent said the course helped

little or none on the job with another 20 percent having no opportunity to tell. This group had completed the highest number of courses previously, and 76 percent said they would continue to work toward a degree.

4. The general conclusion in regard to the extended day students is that they are less satisfied in most ways than the other two groups, and responses seem to have a wider range with more dissatifaction indicated.

Extended Degree Program System

1. The Extended Degree Program was very instrumental in enrolling people over 100 miles from the campus. Most of the EDP students (90%) would not have taken the course if the EDP had not been available. These students were very satisfied with the delivery system as well as with the student/ instructor relationship.

2. Of those completing the course, almost one-half passed with A's and intended to do more course work. Most students in this category felt the course had helped them meet personal objectives, and 80 percent intended to enroll in a course using the same delivery system. About 80 percent found the system convenient and had prior experience with it.

3. Employers reimburse about half of the EDP students, and 87 percent of them are employed. Over half of these students are over 35 years of age.

4. The study concludes that a segment of the market is being served through this program that might otherwise not be served in such a significant way.

Summary

A variety of delivery systems and enrollment options serve the students well. The off-campus delivery systems seem to meet the needs of many students who would not otherwise be served by the university.

Rate of progress and satisfaction are affected by delivery system; however, achievement does not appear to be significantly affected.

Overcoming Resistance to Distance Education

*Lynda Hanrahan**

Over the past two decades, there has been an incredible proliferation of distance education programs throughout the U.S. and internationally. Distance education brings the course to the student, rather than the student to the campus. Instruction may be delivered by one or a combination of media, including print, broadcast, audio or video recordings or even by computer or interactive video.

Teleconferencing and videoconferencing systems are being utilized for all levels of education - from elementary school through college and into the workplace. Each year, over $150 million in training dollars is spent for "teletraining" by business and industry. In academia, distance education programs provide thousands of non-traditional students with opportunities for lifelong learning.

Syracuse University (S.U.) has become one of a growing number of "traditional" academic institutions which have developed a distance education program to meet the needs of students who must earn while they learn. However, the move into distance education at S.U. has not been smooth.

The process of adopting an innovation by an established institution is rarely smooth. The fits and starts of the adoption process are often the norm. For those who manage college distance education programs, there is often an unstated, but important goal to increase acceptance of the program by faculty and administrators. Diffusion research, especially that of Everett Rogers (1983) provides a good source of strategies managers can use to increase acceptance of distance education programs meeting the needs of continuing education students. This paper examines the S.U. experience in relation to the particular characteristics of the innovation that may eventually determine the success of the program.

Barriers to Distance Education

There are still many barriers to the adoption of distance education and other media-based instructional methods in higher education. Two of the most tenacious barriers that generally crop up are strategic planning and faculty resistance. Poor planning and administration can have a devastating effect on these programs. On the issue of resistance, Koontz (1989) and Evans (1968) report that college faculty may believe any number of myths and misconceptions about television teaching: the courses are not as rigorous; the quality is generally poor; instructional television is ineffective; telecourse students lack direct faculty-student contact and therefore the motivation to work hard in the course. In addition, many faculty resist the notion of off-campus learning and have little or no sympathy for students whose life situation does not permit them to attend college in a traditional way (Lewis and Wall, 1988).

Distance education is an innovation in academia, since most academic institutions do not yet have such programs. College courses are taught in much the same way they have been for centuries, with students required to attend classes on campus. For those colleges that do offer distance education, the programs often take a back seat to the "real" learning that takes place on the campus. These programs have been called the "stepchildren of college courses," because even though they get high marks from students, faculty and administrators may see them as good for public relations but out of the mainstream of higher education (Managan, 1989).

A Pragmatic Solution

For over thirty-five years, University College (U.C.), S.U.'s continuing education division, has provided a modified type of distance education for engineering students. Instead of sending educational programs to the students, it sent its engineering faculty to conduct classes at its Graduate Centers located in New York at Poughkeepsie, Endicott and Utica/Rome. Corporations in these areas sponsored their engineers into the program to upgrade skills, secure an advanced degree or keep abreast of technological advances. The sheer pace of changing technologies in engineering demands that engineers must continually learn to stay current in their field. Large enrollments in the off-campus Centers have brought many students into full-time study at S.U., and have maintained good public relations with corporate clients.

Enrollments in the Centers surged for a while and have now leveled off. There are several reasons for this:

more engineers with advanced degrees have been hired, the corporations are downsizing which means fewer new hires, and there is increased competition from engineering programs offered by other universities such as RPI, Columbia, Virginia Tech and NTU (National Technological University). These institutions have been using distance education programs longer than S.U. has. NTU, for example, broadcasts telecourses (developed by engineering colleges) throughout the United States and grants engineering degrees to students who complete the NTU program.

As enrollments changed at the Centers, U.C. began to look for ways to maintain the full complement of engineering course offerings without increasing costs. Some courses had to be cancelled due to low enrollment. It was no longer cost-effective to send a professor to one site to teach six or seven students. To maintain a strong off-campus program, U.C. had to look to alternative means to deliver courses. If the courses could be taught at all three sites and managed by one instructor, the course could be offered. Distance education was an obvious solution, especially because the corporate clients were already receptive to this method. S.U. seized an opportunity to apply for a National Science Foundation grant to develop satellite uplink capability. The grant was approved and with matching monies from corporate and local sources, S.U. installed the uplink in 1987.

Developing the Program

Early in the development process, U.C. arranged with the Center for Instructional Development (CID) to deal with two primary concerns they had for the program: quality of instructional materials and administrative coordination. CID provides support to Syracuse University faculty and academic departments to improve courses and curricula. In this instance, CID was to work with engineering faculty to develop and produce videocourses, which would be taped live, duplicated and sent via courier to the three Centers. Full use of the uplink would come later, after the initial experiment proved successful.

CID spent a considerable amount of time working with the first faculty volunteers, helping them to translate their instructional materials into high-quality, camera-ready graphics. An experienced videocourse instructor estimates that it takes twice as much time to produce these materials, but he covers about 40% more material because the course is so well organized. The television graphics are also turned into a set of course notes that are distributed to the students. Having the hard copy in hand compensates for any loss of quality in the final television image.

CID also developed and provided two other key pieces for the program: coordination of the video production and administrative aspects, and the evaluation component.

Formative evaluations initially showed that the videocourses were received half-heartedly by the students. Many students complained about the lack of immediate interaction with the instructor (a common problem with media-based courses). Within a short time, student attitudes became more favorable because they found the videocourses to be flexible (especially if students had to go out of town for work), useful for reviewing, and well-produced. In addition, many students realized that a broader selection of courses was available with the videocourses.

The taped videocourses proved to be a successful venture for U.C. Even with start-up and development costs, the experiment demonstrated that the distance education program could be cost-effective. The next stage was to use the satellite uplink. This process proved to be more complicated than anyone would have thought! Establishing downlinks that would serve our corporate clients, as well as independent students was difficult, at best. A major corporate client which had insisted that U.C. offer telecourses via satellite, could not actually receive (downlink) the courses. CID had to make elaborate arrangements to downlink elsewhere, then retransmit to the corporation or to our Graduate Centers. In addition, we were asked to work around another college's broadcast schedule. Eventually, these kinks have been worked out. U.C. plans to establish a downlink at each Graduate Center to avoid the more complicated downlink arrangements.

Problems with Strategic Planning

During the past two years, U.C. has struggled to put together an advance schedule of telecourse offerings. This is needed to secure satellite time and to promote the courses. It also allows students to plan their courseload for a logical sequence of courses. Until recently, it was difficult to create an advance schedule because faculty regarded telecourse teaching as voluntary. Their research activities often interfere with the intense development activities needed for the telecourse.

U.C. has tried various facilitative strategies to engage engineering faculty to volunteer to develop their courses for use in this program. Some of the strategies used were:

(1) conducting informational sessions to describe the development process

(2) providing support services for course production and management (through CID)

(3) providing for formative evaluation of the tele-

courses

(4) developing a system of incentives and rewards.

In planning for distance education, the issue of rewards and incentives deserves attention. Faculty have been rightfully concerned about how telecourses would be treated with regard to teaching load, paychecks and credit toward tenure and promotion. Other concerns fit with what Dillon (1989) calls "academic credibility and personal rewards." An up front payment for development may be considered inadequate compared to the preparation involved. The issue of teaching load may be unclear. It is clear, however, that time spent developing a telecourse does not count toward tenure and promotion. This is restrictive for untenured faculty or for those with heavy research obligations. As for academic credibility, S.U. telecourse faculty are not now highly regarded, as they are in some universities. The personal rewards for teaching on television are intrinsic, unless the administration makes provisions for the extrinsic rewards.

Strategies to Increase the Acceptance of Distance Education

Perceived characteristics of innovations are often used in diffusion research to predict their rate of adoption. Rogers book, *Diffusion of Innovations* (1983) names five attributes of innovations that he has used to derive generalizations from studies of adoption: relative advantage, compatibility, complexity, trialability and observability. Each of these attributes, with the exception of complexity, is positively related to the rate of adoption. In this case, the way the attributes of distance education are perceived by the faculty or the administration is related to how quickly they will agree to become involved.

The "fits and starts" experienced in the adoption process for distance education at S.U. may be compared to Rogers' generalizations. Managers of distance education may be able to address the common problems related to perceived attributes of innovations. Therefore, by implementing strategies that address these problems, the manager may increase the acceptance (adoption) of the distance education program.

Relative Advantage

Rogers indicates that relative advantage, or the degree that the innovation is seen as being superior to previous practice, is one of the best predictors of successful adoption. Relative advantage for distance education could be viewed as status-giving, profitability or cost-effectiveness, an improvement in practice or various faculty incentives. This topic is worth a thorough examination. In this case, the manager's ability to promote the relative advantage of distance education is critical to its adoption and eventual success.

Status... In this case, having an uplink confers status upon S.U., putting us in the "big league," a major player in the telecourse arena of distance education for engineers. Faculty may also reap the benefits of an increase in status: they are more visible to the corporate client, and may be chosen for a special research assignment, consultation or conference. On the other hand, some faculty fear the increased visibility of television because it highlights their mistakes or inadequacies in presentation style.

Cost-effectiveness... Distance education certainly has the potential to be more cost-efficient and cost-effective than conventional education, depending upon how well the system is designed and managed (Rumble, 1987). Satellite time is very expensive. It is many downlinks and large enrollments that improve the profit margin. S.U. does not yet have this economy of scale. Even so, the satellite telecourses have been marginally profitable, and the taped video-courses very profitable according to recent estimates.

Improvement in Practice... There are many colleges that offer distance education programs as a part of their continuing education divisions, but part of the problem is that these programs are often considered to be academically inferior to conventional classroom instruction. Distance education is proven to be an effective method of delivering instruction (Clark and Verduin, Jr., 1989), although course development for a quality telecourse is not entirely simple. These are complex programs that represent a departure from conventional (classroom lectures with students present) types of education. The relative advantage here is gained when the faculty member sees this process as an opportunity to improve the course by obtaining professional assistance in areas such as design, graphics development and evaluation. The payoff comes when the professor has a set of professionally produced graphics ready (with minor modifications) for a conference or special lecture.

Incentives... Faculty incentives are critical for the perception of relative advantage. Strategic planning for distance education must address the issues of tenure and promotion, as mentioned above. One incentive here is the major savings in travel time, even though the professors will travel to each of the Centers during the semester, they do so less often. Time is critical for professors engaged in research activities.

Compatibility

According to Rogers, compatibility means that the

innovation is a good fit with existing values, past experiences and adopter needs. Issues of compatibility are especially relevant to distance education, given the general attitude of professors toward "unconventional" instruction, including instructional television. The development of the distance education program must be seen as compatible with the needs of the academic department. Here, academic administration must be vocal in demonstrating compatibility with department goals and existing values.

Complexity

Rogers' research shows that innovations perceived as complex are less likely to be adopted. Distance education is a complex process of development and management, especially for college instructors who are used to developing their courses on their own. The basic strategy is to make the development process as transparent as possible, while maintaining quality of the product at the same time.

Trialability and Observability

Rogers demonstrates that if an innovation can be tried before it is wholly implemented, and if people can observe how it works before making a commitment, the rate of adoption is faster. At S.U., we encourage the faculty member to try his/her ability in front of the camera for a trial run. Engineering faculty have many opportunities to observe distance education programs, both ours and theirs, through a downlink at their college. They can pass by the open door to the control room near the studio classroom and watch what is going on. Demonstrations set up by CID are another way to get faculty involved.

Summary

Within the next decade, distance education may play a major part in adult education and in the training of our workforce. Like other universities, Syracuse University could institutionalize and expand distance education to include additional degree offerings. To do this, the faculty and administration will have to have a positive experience with distance education. At S.U., the experience gained from working out the bugs with the College of Engineering should now make the process of adoption by other departments much easier.

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* Lynda Hanrahan is a doctoral candidate in the IDD&E program and the Instructional Video Coordinator for Center for Instructional Development (CID) at Syracuse University.

SERC: TEACHER INSERVICE VIA SATELLITE

Diane Grinvalsky, Coordinator
SERC Teleconference Production
Wisconsin Public Television

Rosemary Jacobson, Director
Teleproduction Center
University of Wisconsin-Stout

Introduction

The use of satellite technology to provide inservice and training opportunities is as viable in education as it is in industry. The Satellite Educational Resources Consortium has been a leader in offering video teleconferences for elementary and secondary educators, as well as credit courses for high school students. Critical to the success of these teleconferences is the planning and preparation that determines content areas, content specialists, print materials, and production techniques which will best serve the needs of the subject and the audience. This presentation will give an overview of the process for selection of topics appropriate for video teleconference workshops, the elements of the teleconference which must be designed and implemented, and the visual aspects of the event which must be afforded the attention warranted by the use of this medium.

SERC

The Satellite Educational Resources Consortium (SERC - pronounced ser-see) is a multi-state collaboration of state departments of education, local school districts, state and local television entities, instructional program producers, university educators and private industry. SERC was formed to pool members' technological and educational resources to help schools meet severe teacher shortages in critical subject areas. By pooling their resources, SERC's members are able to take advantage of economies of scale in the purchase of transmission and delivery equipment, share program production capabilities, develop effective evaluation tools and criteria, and enhance information exchange. The consortium provides for-credit courses via satellite television to high school students for whom the courses would otherwise be unavailable. SERC also offers inservice and graduate courses for teachers.

The Wisconsin Department of Public Instruction and the Wisconsin Educational Comminications Board have cooperated to allow Wisconsin membership in SERC. Together, the entities have members on the SERC Board of Directors and the Instructional Advisory Committee and help determine the governing policies as well as the course offerings of the consortium.

Wisconsin Educational Communications Board

The Wisconsin ECB is the state agency charged with overseeing the organization, development and operation of a framework of telecommunications for educational purposes throughout the state. This task is accomplished through Wisconsin Public Radio and Television, which are run by the Educational Communications Board.

The ECB is also involved in national educational endeavors which will benefit Wisconsin students. Wisconsin Public Telecommunications for Education is the instructional, K-12 and post secondary programming

and services division. This division develops and produces innovative educational programs for delivery via the in-state telecommunications framework and via satellite through SERC and other signal distribution networks throughout the United States. Wisconsin Public Telecommunications for Education is working with and through SERC to produce and distribute the teacher inservice series of workshops and telecourses. Educational credit in the form of Equivalency Clock Hours (ECH), Educational Credit Units (ECUs) or Graduate Credit Hours is available to the teachers and administrators who view the teleconferences in their own school district, at their local universities or their local Public Broadcasting station sites.

The production of six live inservice workshops over thirty-six satellite hours and two live graduate courses of forty-five hours each via satellite is the 1990-91 goal. This task will be accomplished by the Wisconsin Public Telecommunications for Education division in cooperation with the University of Wisconsin-Extension and the Wisconsin Department of Public Instruction and offered through SERC.

SERC/Wisconsin Teleconference Topic Selection

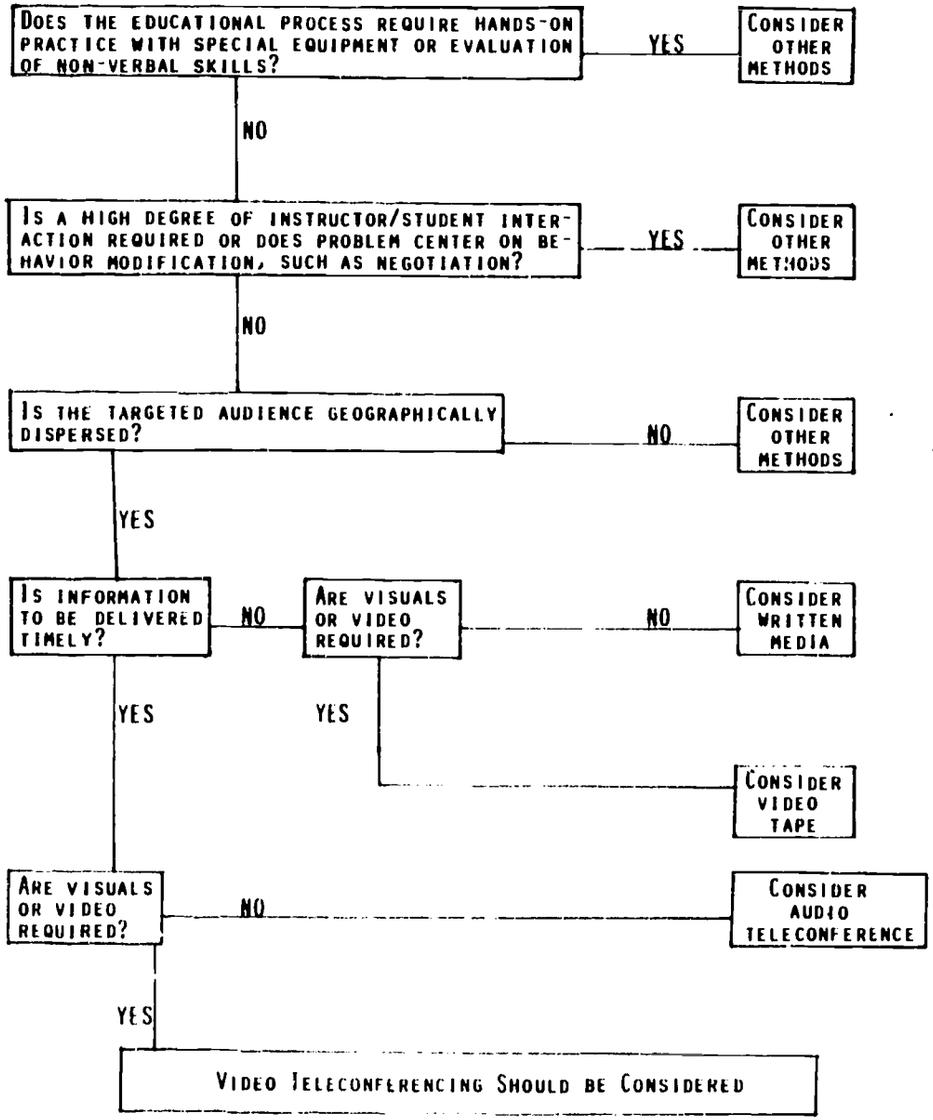
Appropriate topics for development as SERC workshops are provided to the Wisconsin Public Telecommunications for Education (WPTE) division from a variety of sources, including previous conference participants, experts in the field of education on both the state and national level and the SERC organization itself (See Chart A). After a thorough review by Wisconsin agencies (DPI, ECB and Extension), a core of topic ideas is subjected to a second review by the staff of the WPTE division (See Chart B) to determine whether the educational process necessary for sharing information about each topic is appropriate for video teleconferencing. Those topics which pass these "tests" are presented to SERC, which makes the final selection. WPTE, in cooperation with the other Wisconsin agencies, then moves ahead to develop the series of interactive video teleconferences.

Elements of the Teleconference

Critical to the successful implementation of any teleconference is a careful consideration of the following elements: 1) audience identification, 2) content, 3) marketing, 4) conference format, 5) choice of transmission time, 6) cost and registration method, 7) accessibility of receive sites, 8) selection of content consultants, 9) preparation/dissemination of appropriate print materials, 10) selection of guest presenters, 11) production of the visual element of the teleconference and, 12) follow-up.

Decisions regarding each of these elements should be highly content-driven and strongly influenced by the make-up of the audience in order to have a positive effect on the outcome of the teleconference. For instance, scheduling a non-credit teleconference for teachers on a weekend, especially if they will not be reimbursed in some way for their time, is highly questionable. Or, if the audience is expected to prepare for the teleconference by reading reprinted articles or by responding to a questionnaire, don't send the materials at the "eleventh" hour . . . even though you're sure the participants will wait until that time to complete the assignment!

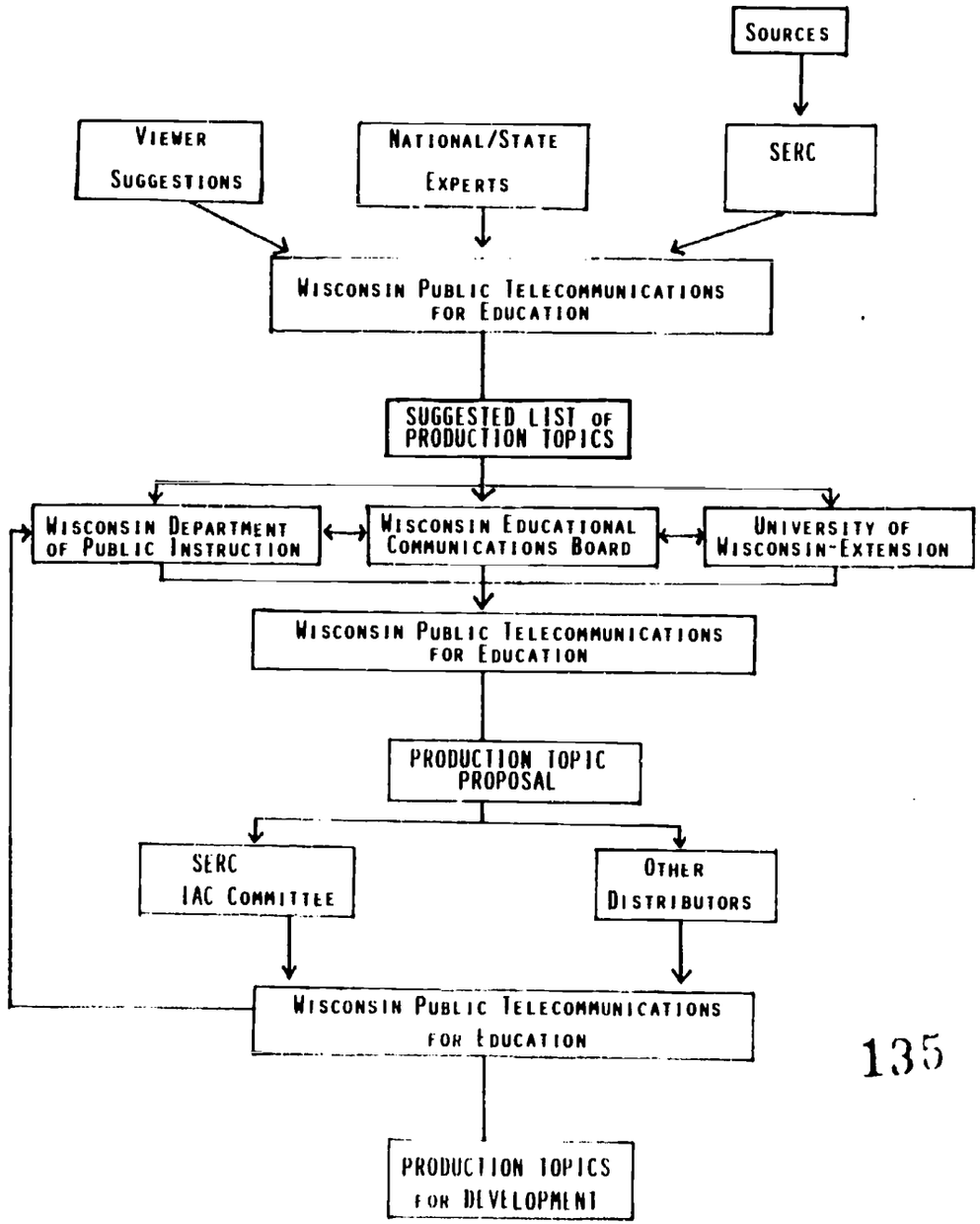
SELECTION FLOW CHART FOR VIDEO TELECONFERENCING



ADAPTED FROM REISER AND GAGNE, SELECTING MEDIA FOR INSTRUCTION, 1983.

[Chart B]

SERC/WISCONSIN TELECONFERENCE TOPIC SELECTION PROCESS



[Chart A]

The production quality of the teleconference is extremely important. This is, after all, a visual medium. At best, the proper use of the technology will enhance the presentation of materials. At worst, haphazard or sloppy use of the technology will distract from or obscure the message. Producers and presenters must be willing to work closely with one another from the earliest possible time to design and develop visual materials which will be an integral part of the information conveyed during the teleconference. The same criteria for judging the quality of media used in an instructional setting apply to media used in a teleconference. Graphics must be legible and simple, video inserts well-edited and within technical standards, models and other "props" well-lit and accessible to the cameras.

Conclusions

Research and planning are as important to the successful teacher inservice teleconference as they are to any other well-executed presentation. While the potential for live interaction and spontaneity is a compelling reason to offer instruction and training through the use of satellite technology, that potential is difficult to realize unless time and effort have been spent to adequately educate all of the participants in the use of the medium. The well-planned, professionally produced video teleconference is an effective way to provide adult instruction at a distance.

PLANNING AND IMPLEMENTING AN ITV WELLNESS PROGRAM FOR OLDER ADULTS

R. A. Wroblewski, B.S.N.
A Wellness Program For Older Adults
Northcentral Technical College
1000 Campus Drive
Wausau, Wisconsin 54401

Introduction

Recognizing the need for health promotion/wellness education in older adults, Project H.E.A.L.T.H. (Helping Elders Adjust Lifestyles Toward Health) was written to improve the health status of adults 55 and over in rural northern Wisconsin. A proposal was submitted to the W. K. Kellogg Foundation by the Northwoods Health Careers Consortium (NHCC). The Consortium was comprised of Northcentral Technical College (NTC) of Wausau, Wisconsin, and Nicolet Area Technical College (NATC) of Rhinelander, Wisconsin. With funding approved, the project began in the fall of 1986 to extend over a five-year period.

The three major objectives of Project H.E.A.L.T.H. are: (1) to improve the lifestyle behaviors of elderly citizens through health education/wellness promotion and acceptance of responsibility for good health habits, (2) to train facilitators who work with the elderly in understanding the older adult, learning styles, wellness education, and promotion of healthy lifestyle behaviors, and (3) to implement an alternative delivery system capable of bringing the instruction to the underserved rural areas of the consortium district.

This presentation will: (1) identify how the interactive television system is used to meet the health education/wellness needs of older adults in urban and rural northern Wisconsin, (2) describe the collaboration necessary to initiate the project, develop strategic receive sites, deliver programming, and evaluate the process, and (3) explore the potential of the findings for future ITV programming to older adults in rural areas.

Description

Because of the vast geographical area served by the NHCC, the Board investigated ways to provide educational services to the older adult in a cost-effective manner. The ITV approach was chosen since it demonstrated a cost saving in the area of travel and staff time. Further, winter travel was reduced by all involved. In addition, both NATC and NTC had a closed circuit television system to build on and NTC had two years' experience with ITV course offerings.

Since the purpose of Project H.E.A.L.T.H. is to improve lifestyle behaviors through increased knowledge about healthy living, the quality and quantity of instruction required to accomplish this goal needed to be determined. Nola Pender's Health Promotion Model serves as a theoretical model for this project. It summarizes the multitude of factors which influence the likelihood of engaging in health promoting behaviors indicating that behavior change is a complex process. While there are no formulas in the literature describing the exact content and length of a curriculum to produce behavior change, it is clear that such a curriculum must address both cognitive and behavioral components, with

sufficient time for participants to rehearse any newly learned behaviors. The basic content and length of curriculum is based on a thorough review of the literature, study of health promotion programs, and extensive involvement of advisory committees and focus groups of older adults. The core curriculum components of physical activity, stress management, eating for health, and empowerment are integrated into the major theme of taking personal responsibility for health. This format implies a lengthy curriculum which can affect participant retention. Survey data from the advisory committees and focus groups indicated that many older adults are reluctant to enroll in a program with a long-term commitment. Balancing the content factor with the retention factor, the 10-week (20-hour) curriculum was developed with the following weekly themes: Introduction to Project H.E.A.L.T.H., Physical Activity--Basic, Managing Stress, Living Longer Loving Life, Eating for HEALTH, Enhancing Mental Fitness, Relating to Our World--Communication & Consumerism, Physical Activity--Advanced, Designing Our Personal Environment--Being in Control, and Summary and Development of Lifestyle Change Plan.

A Project H.E.A.L.T.H. handbook was developed to reinforce and supplement the content of the weekly sessions. The goal was to develop a comprehensive, yet not overwhelming, volume. Participants were encouraged to view the handbook as a source of future reference as well as a session guide. Illustrations developed were non-ageist, attractive, and conveyed the message that "though staying healthy is serious business, it should also be fun." The message is that mastery of lifestyle is an ongoing process and that learning should continue after the sessions are completed.

The design for Project H.E.A.L.T.H. is based on the principles of participatory learning and team presentation. The team included a moderator, facilitator, and guest presenter. The moderator coordinated the sessions and the facilitator served as an aide to the participant in routine activities. Together they filled the roles of enabler, supporter, and encourager serving as a resource for information lending continuity and building rapport among the group. The guest presenter provided variety and expertise in the specific content areas. Each team member was required to participate in a training session which included a review of the principles of adult learning, the ITV system, the developmental changes of the older adult, and the concept of wellness.

Methodology

Participants were self-selected, predominantly female, unemployed with an average age of 69. They were recruited through senior centers, media ads, brochures, and local organizations. The curriculum was piloted to a study group of 52 participants at the Riverside Senior Center in Wausau, Wisconsin. A comparison group of 40 was identified in Antigo, Wisconsin, 35 miles away. Data collected at the end of the curriculum pilot validated the curriculum and the delivery method. The ITV pilot followed with a group of 110 participants in the study group and a comparison group of 29. The study groups were at 6 different locations: Marathon City, Municipal Center; Medford, NTC West Campus; Mosinee, Maplewood Apartments; Wausau, NTC Studio; Tomahawk, Lincoln Hills School; and Rhinelander, NATC Campus. The comparison group participated at the Homme Home Nutrition Site in Wittenberg.

Site selection was executed by gathering information in respect to ability to receive the signal at a particular site, an older adult group interested in the health promotion program, and a facility to safely accommodate a group of 15 to 20 persons. It was necessary to negotiate with county and town officials to obtain permission to do the necessary wiring and antennae erection at the Medford and Mosinee sites.

Evaluation

The participants were asked to respond to the curriculum content and the ITV experience in detail. Guest presenters and facilitators also participated in the evaluation process. Evaluation of the study and comparison groups included demographic items and several tools to assess the validity of the curriculum, as well as indicators to evaluate lifestyle, health perception, social behaviors, self-responsibility, exercise, nutrition, stress management, and self-actualization.

The evaluation process began with a pretest and included data collection at the tenth session. A follow-up program at 3 months, 6 months, and 1 year was held to provide an opportunity for interpersonal support, idea exchange, and further data collection.

Analysis of the data collected at the pre, post, 6-month, and 1-year timeline of the curriculum pilot revealed a significant difference in four specific behavior areas: level of exercise, perceptions in loss, improved communication with their doctor, and having an operating fire extinguisher in their home.

Reaction of the older adult participants to the ITV system was overwhelmingly positive documenting comfort with the system and the "push-to-talk" microphones. The negative responses occurred at the sites that experienced technical difficulty and in persons with vision and hearing difficulties. In spite of special effort to accommodate these people, they reported it as a problem. This accounted for 10 to 12 of the sample. Data relating to the ITV pilot is currently being analyzed for significant differences in the above areas.

Summary

To date Project H.E.A.L.T.H. has successfully met the three major objectives of the program.

The data collected supports that the interactive television format was well received by the participants. Most were eager to contribute to the discussions with the use of the push-to-talk microphones. The participant evaluation surveys revealed overall acceptance of the curriculum and the ITV method of delivery. Project H.E.A.L.T.H. has made a positive impact on the knowledge base of older adults enabling them to take responsibility to lead healthier lives. The interactive television system is an effective delivery method for health education and wellness promotion. This study demonstrates that under favorable conditions for ITV signal reception, it is possible to deliver programming to older adults in the rural areas in their own communities.

DEFINING A ROLE FOR TELEVISION IN DISTANCE EDUCATION: WHY RESEARCH HAS FAILED

Mark Bullen
University of British Columbia
UBC Access—Guided Independent Study

Abstract

Selecting media in distance education has serious cost implications and it is assumed that it also has pedagogical implications. However, despite over 30 years of media research, little is known about the role and effects of television and other media in delivering distance education for adults. Questions such as: "What media should be used to deliver instruction?" or "Does television or any medium or format within a medium have an advantage over any other in terms of student achievement and satisfaction?" have not been properly addressed by research. This paper examines recent research and attempts to explain its failure to adequately answer questions about the use of television in adult distance education.

The two most significant and inter-related factors proposed are the dominance of experimental or quasi-experimental research methods, and the assumption of a quantitative conception of knowledge. In addition, it is argued that much of the research is methodologically weak.

Rather than rejecting or attempting to perfect the experimental approach, this paper suggests it would be more fruitful to adopt a pragmatic, neo-qualitative approach that combines both quantitative and qualitative research methodologies but which is consistent with a qualitative conception of knowledge.

Introduction

One of the most important decisions that course designers and others involved in the development of distance education materials must make is what media to use. This decision has serious cost implications and it is assumed that it also has pedagogical implications. However, as far as the latter is concerned, the research is equivocal. There is evidence that learning at a distance is as effective or more effective, in terms of student achievement, than learning in the classroom, and research indicates that learning will occur no matter what medium we use to deliver instruction to students at a distance (Schramm, 1977; Smith, 1983). But distance education research has not provided practical and dependable instructional design guidelines that are based on instructional effectiveness (Campeau, 1974). In fact, much of the research that attempts to compare student achievement in different delivery modes is of questionable quality (Bates, 1981; Prosser, 1984; Chacon-Duque, 1985; Shavelson, Webb, & Hotta, 1987).

As a result of the shortcomings of research, much of the instructional design in distance education is based on the intuition of the course designers and authors, resource limitations and the political considerations of the policy makers. In effect, many of the instructional design decisions are arbitrary and not based on any sound theory or research (Campeau, 1974).

Distance education has matured and should no longer be seriously questioned as a way of delivering instruction to adults. What is important now is to look critically at the design of distance education materials and how the adult learner uses them. The use of nonprint media in distance education can be extremely expensive, yet we know very little about the effectiveness, in terms of student learning and student attitudes, of different media. What media should be used to deliver instruction? Does any medium or format within a medium have an advantage over any other in terms of student achievement and satisfaction? Research, thus far, has not been able to answer these questions yet they need to be answered with some degree of certainty in order to provide a rational and theoretical research base for instructional design in distance education.

Two aspects of past research into the effects of television in distance education on student achievement and attitudes are examined in this paper: the findings, and the approaches to research. In examining the research approaches, two factors stand out clearly: the dominance of experimental or quasi-experimental methodologies; and the assumption by researchers of a quantitative conception of knowledge. The significance of the research findings is that they have been neither consistent nor meaningful. It is argued that these three factors, the dominance of the experimental methods, the assumption of a quantitative conception of knowledge, and the lack of meaningful and consistent results are evidence of the need for a change of approach; one that is based on a qualitative conception of knowledge and that uses both qualitative and quantitative research methodologies.

Experimental Research

There have only been a few attempts to conduct truly experimental research in this area. Sullivan et al (1979) compared four methods of instruction for their effects on student achievement and attitudes: live lecture, live videotape, studio-produced videotape, and videotape of a live lecture. Hult (1980) studied the effect of instructor contact on achievement and attitudes by comparing live instruction, videotaped instruction with no instructor contact, and videotaped instruction with contact. Brown, Brown & Danielson (1975) looked at the effects of different instructional treatments (how the content was presented, type of presenter) on achievement and attitudes and the interaction of these treatments with learner characteristics such as age, reading ability and educational level.

The results indicate that student achievement is higher in face-to-face instruction; that students have a more positive attitude towards a course with some instructor contact; and that student achievement is higher when they perceive the presenter in a videotape to be credible.

All of these conclusions must be viewed with caution however. None of the studies attempted to probe possible qualitative differences in learning that might result from using different media for instruction. Student attitudes were also approached from a quantitative perspective. The experimental situations were often unnatural and unrepresentative of real learning situations and the random assignment of subjects may have forced students into treatments they would not normally choose. Sullivan et al (1979) implicitly question the external validity of their study when they specify the following conditions: the subject matter must be novel but interesting; its achievement must be able to be measured precisely; the subjects' initial level of prior knowledge must be low; and the experimental design must permit both teaching and testing during one class period. Hult's (1980) study used a more natural learning context—a complete course—as a unit of comparison, but control of learning outside the treatment situation and random assignment are not apparent. Finally, Brown, Brown & Danielson admit the external validity of their study is in question when they state "these results were obtained from adults seeing very short segments in a one-exposure situation. Whether the results generalize to a longer learning exposure or to a series of programs is undetermined" (p. 402). In brief, little can be learned from these studies.

Quasi Experimental Research

Most research in this field falls into the quasi-experimental category. These are studies in which the experimenter does not have complete control over the experimental environment (Campbell & Stanley, 1963). It means, for instance, that the learning situation or task cannot be completely manipulated to suit the experimenter. The experimenter is thus forced to accept a more natural learning situation.

While the there are more quasi-experimental than experimental studies, the frequent lack of experimental control raises serious questions about their internal validity. On the other hand, the fact that the studies have been conducted in natural settings means they have the potential to be applicable to more than just the experimental condition.

The quasi-experimental studies can be grouped into four categories: comparisons of student achievement in face-to-face instruction with telecourses (Mount & Waiters, 1980; Agler, 1976; Agler & Tinn, 1976; Smith, 1983; Clagett, 1983; Donsky et al, 1983; Zigerell & Chausow, 1983); comparison of student achievement in telecourses with face-to-face instruction which incorporates television (Brown, 1976); attitudes of learners towards television (Brown, 1975, 1976; Sell, 1976); the relative importance of various course components in distance education as perceived by learners (Purdy, 1978; Dallas Community College District, 1983); and televised classroom instruction (Robinson & West, 1986; Dillon, Haynes & Price, 1990).

These studies indicate that there is no significant difference between the achievement of learners taking telecourses, or viewing live instruction using compressed video, and those taking the face-to-face instruction. They reveal that students prefer instructional television programs that present material that is explicitly related to the course; they are not pleased when the programs appear to be entertainment; they have negative attitudes towards compressed video; and they do not value television programs that repeat material that is in other course components. Students also appear to prefer television programs in which the presenter is actually an actor in the vignettes rather than a third party describing them.

As in the case with the experimental studies, however, caution must be applied in interpreting these results because there are serious methodological problems with many of these studies. Mount and Waiters (1980) did not control for initial ability levels. Agler and Tinn (1976) do not appear to have controlled for confounding variables such as different instructors or different measurement instruments. Smith (1983) attempted to find out what types of courses should be offered by television and what formats used but only compared achievement levels of telecourses with parallel on-campus courses. There does not appear to have been any control of variables in Clagett's (1983) survey of final distributions of telecredit and on-campus students. Donsky et al (1983) calculated student scores differently in their treatment and control groups, there were no pre- or post-test observations and there were significant demographic differences in the two groups. It is questionable if any variables were controlled in Zigerell & Chausow's (1983) study. These are just a few of the methodological problems found in the quasi-experimental studies which make their findings suspect.

From a qualitative perspective, the quasi-experimental studies offer the advantage that they use more natural learning situations—complete courses with learners who are taking the courses because they want to and not because they have been randomly assigned into a treatment or control group. However, because all except one of these studies still approach learning from a quantitative perspective—viewing it essentially as a reproductive process—they have focussed primarily on achievement scores. Thus they reveal little about the quality of learning and their experimental validity is compromised. The one exception, Dillon, Haynes & Price (1990), went beyond a simple comparison of achievement scores and measured student outcomes by level of learning. In addition, this study incorporated site observations, interviews and an analysis of classroom interactions.

Despite the abundance of research in this field then, there are only a few meaningful results. The most important conclusion that can be drawn is that there is no conclusive evidence that the use of television in distance education affects student achievement or attitudes. The research, however, fails to deal with specifics of course delivery. Instead there seems to be a preoccupation with attempting to prove the value of distance education in general.

Research Approaches

A major reason for the lack of meaningful findings has already been alluded to: the dominance of research conducted in the hypothetico-deductive paradigm using experimental or quasi-experimental methods. This paradigm assumes a quantitative conception of knowledge which views learning as essentially a reproductive process. Consequently, researchers have focused almost exclusively on comparing achievement and attitudes in narrow quantitative terms. It has been extremely difficult to accomplish this in properly controlled experiments, so we are left with results that not only are inconclusive about the quantity of learning, but also reveal nothing about the quality of learning. The few studies that approached perfection in terms of experimental control have imposed such strict conditions on the learning situations involved that they are extremely unnatural and thus have questionable ecological validity.

The qualitative approach attempts to examine phenomena from the perspective of the subject as it occurs in the natural setting (Rist, 1982; Dahlgren, 1984; Fetterman, 1988; Marton, 1988). Qualitative data gathering techniques include participant observation, in-depth interviewing and documentary analysis. Data analysis involves classifying data into a scheme that allows themes, concepts and eventually hypotheses to emerge. Data collection, data analysis and hypothesizing are concurrent and iterative procedures that drive each other and determine the direction of the research. The qualitative conception of knowledge views learning as a process in which learners actively interpret, adapt and apply the knowledge or information they acquire. There is less emphasis on "how much is learned" and more on "what is learned" (Dahlgren, 1984).

The qualitative approach is employed regularly in sociology and anthropology (Filstead, 1970; Hammersley & Atkinson, 1983; Burgess, 1984); it is gaining acceptance in the field of marketing (Hirschman, 1986); and there is an increasing awareness of its value in education (Bogdan & Biklen, 1982; LeCompte & Goetz, 1982; Rist, 1982; Minnis, 1985; Fetterman, 1988). Alexander (1990) has applied the qualitative approach in developing a program evaluation model at the University of Victoria and Carriere (1990) has proposed the use of the qualitative *phenomenographic* approach to study intercultural learning.

Rist (1982) argues that the "hegemony" of the hypothetico-deductive paradigm in education research is quickly dissolving because of its inability to address the *process* of education, particularly from the point of view of the learner. The research reviewed here supports that view and suggests another reason: the inability of the experimental approach to relate outcomes to process. Research has examined the effect of different media variables on student achievement (with limited success), but no attempt has been made to relate that achievement to the process the learner engages in to learn. To do that requires a change in perspective, one that is not readily afforded by the experimental approach. To understand how learners interact with their learning environment requires an approach that looks at the entire context of learning from the subjects' point of view. That approach is found in the qualitative methodologies.

The qualitative approach also allows qualitative differences in learning to emerge (Dahlgren, 1984; Entwistle, 1984; Marton, 1988). One of the major shortcomings of research in this field is the superficiality of the achievement measures. In virtually all of studies reviewed, they were paper and pencil tests employing multiple choice or short answer questions. Research which uses qualitative methods to analyze learning has revealed important qualitative differences in student understanding of key concepts in different subject areas that were not revealed by traditional quantitative tests of achievement (Dahlgren, 1984; Entwistle, 1984; Marton, 1988).

Finally, the qualitative approach uses inductive rather than deductive reasoning (Filstead, 1970; Glaser & Strauss, 1970; Wilson, 1977). In the hypothetico-deductive paradigm, theories are developed, hypotheses are formulated and then variables are manipulated in an experimental setting in an attempt to test the hypotheses. This assumes that researchers know in advance what the critical variables will be, and, qualitative researchers argue, this preoccupation with a specific hypothesis may result in important events being missed or ignored (Dalton, 1964; Wilson, 1977, Burgess, 1984). These criticisms are particularly relevant to the study of learning (and more so to learning at a distance) where there are many complex, interrelated and sometimes unobservable factors. The inductive logic of the qualitative approach uses data collected in the natural setting to *generate* hypotheses, develop theories and, ideally, test these theories in the same setting. This cyclical process results in theories that are "grounded" in the empirical world (Glaser & Strauss, 1970).

Conclusions

On the basis of the research reviewed here, it is tempting to completely reject the quantitative approach and embrace qualitative research. Some argue that there is no alternative but to completely accept or reject one approach because they are rooted in incompatible philosophies of knowledge: positivism vs. constructivism (Firestone, 1987). A more pragmatic approach is suggested here: a neo-qualitative approach which would draw on the strengths of both qualitative and quantitative methods to examine, with a qualitative conception of knowledge, the process and outcomes of learning. The strengths of the qualitative approach are its attempt to examine phenomena from the perspective of the learner, its use of natural learning situations, and its data gathering and analysis techniques; the strengths of the quantitative approach are some of its statistical data analysis techniques. Alexander's (1990) *Convergence Model* of program evaluation is an example of the convergence of quantitative and qualitative methodologies in one design. The study of compressed video by Dillon, Haynes & Price (1990), while primarily quasi-experimental, also combines the two approaches. It also attempts to go beyond the superficial measures of student achievement found in most of the other studies.

It is hoped that a more widespread use of this neo-qualitative approach will result in more substantial findings about how and what adults learn from television in distance education will emerge. More generally it is hoped that some insight would be gained into how and what adults learn from all methods of delivery such as printed material, audio cassettes and audio teleconferences. Equally important would be student reactions to and feelings about the different components of the course.

Even if there is no difference in either the quantity or quality of learning, it is not unreasonable to question whether different media or methods of delivery might have an affect on students' perception of the course, the instructor, or the subject matter. Highly achieving students who never want to deal with the subject matter again are clearly qualitatively different from students who finish their course with enthusiasm and an enduring interest in the subject. Research conducted in the hypothetico-deductive paradigm has not provided answers to these questions because the experimental methodology usually associated with it makes it difficult and because it carries with it a conception of knowledge which does not permit these types of questions to be asked.

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Using Multiple Technologies in a Secretarial Science Class Delivered by Satellite

William F. Murphy, Jr.
Distance Learning Specialist
Satellite Program Coordinator
Virginia Cooperative Extension
Virginia Tech

The following is a summary of a presentation given during the Sixth Annual Conference on Distance Teaching/Learning.

Introduction

During 1988, a statewide analysis of staff development needs of personnel in Virginia Cooperative Extension (VCE) was conducted. The analysis indicated a strong need for professional development opportunities for field-based secretarial staff. Subsequent discussions with the Virginia Tech Personnel Office revealed that a local community college was providing campus-based secretaries with credit and continuing education classes in the secretarial sciences.

VCE approached New River Community College (NRCC) with the idea of teaching a pilot credit class in Office Procedures to Extension field-based secretaries via satellite. NRCC readily agreed to become involved in this distance learning activity and a contract was developed between the two institutions.

The course would be delivered by satellite, using the Virginia Tech Teleport (Simulsat C-Band Uplink), the VCE Satellite Downlink system (56 C-band downlinks statewide), and the VCE's Computer Network (130+ nodes statewide). VCE would also provide technical support and instructional design for the class, production costs, uplink and satellite time, mailing costs, and tuition to NRCC. NRCC was the credit-granting institution and provided the instructor, curriculum materials, and some graphic support.

Delivery Systems

The challenge of the course development team was to achieve the educational objectives of the class by employing the appropriate instructional technologies. While any number of technologies may be appropriate for a given class, the resources available is ultimately the final determinant. Fortunately, a number of "in-place" mature technology systems were available and used in the design of this class.

The initial class meetings were 3 hours long and held in traditional classroom settings in each of six Extension districts throughout the Commonwealth at the beginning of the Fall semester, 1989. A total of 127 secretaries participated and completed the class. One additional "face to face" class meeting was held 10

weeks into the 15 week semester, during a state-wide Extension secretaries meeting. The largest part of the instruction was 14 one and one-half hour classes delivered by satellite (1 way video, 2 way audio) to 56 Extension downlink sites.

All students had unique computer userids (assigned to Extension unit offices) and could communicate using E-mail and file transfer protocols with the instructor and other students. The instructor maintained electronic office hours as well as traditional office hours for phone interaction with students. The computer system also allowed for the submission of class assignments electronically. In addition, students were assigned to Electronic Study Groups (see below).

Audio conferencing techonolgies were extensively employed, using the Commonwealth of Virginia's phone bridging services. Existing and pre-produced videos were also used in the satellite delivery of the class. VCE's mailing system (alternate day UPS delivery to all Extension units statewide) was utilized in delivering course materials to students.

Electronic Study Groups

The 127 students were placed in 12 electronic study groups to facilitate student/student interaction and the completion of group assignments and projects. Each group was assigned a unique listserve computer userid that could be used for group communications. A conscious effort was made to mix the composition of those groups, so that office-mates were not in the same group and Extension districts were scrambled. This provided an environment for interaction between professional secretaries from different parts of the state and promoted an expansion of the networking that was already occurring among secretarial staff.

Evaluating the Technologies

The evaluation plan had two phases, the Process Evaluation and the Outcome Evaluation. Process Evaluation included documentation of time on the project, service costs, accounting records, secretaries travel, informal comments from participants, and focus group interviews of students. The Outcomes Evaluation looked at student satisfaction with the technologies and class delivery (reported in this paper), some student demographic information, and an analysis of behavioural changes of secretaries enrolled in the class.

The response rate for this survey was 83%, with 105 of 127 secretaries responding. Student satisfaction levels were recorded for the technologies and instructional methodologies employed in the delivery of this class to Extension secretaries. Students responded as 1) very dissatisfied, 2) dissatisfied, 3) satisfied, and 4) very satisfied.

The following chart summarizes the percent of student responses to the "Very Satisfied" or "Satisfied" rankings.

Technology/Methodology	Very Satisfied	Satisfied
Satellite Broadcasting	66%	25%
Videos	44%	46%
Overheads/Computer Generated Graphics	42%	42%
Phone during Broadcast	32%	31%
Audio Conferencing	55%	30%
Electronic Office Hours	67%	28%
Access to Instructor by Phone	67%	28%
Study Groups communicating by Computer	85%	12%
Individuals communicating by Computer	85%	12%
Electronic Study Groups (concept)	56%	33%
Computer Network for Class Assignments	74%	20%
Instructor Communicating with Computer	77%	16%
Extension Mailing System	74%	20%

Learner Reaction to Distance Learning by Satellite

Fifty students (47.6%) worked at a downlink site. The remaining 55 students (52.4%) traveled an average of 26 miles to a downlink site. The vast majority of the students (95.2%) have never been involved in a class using distance learning technologies, but must have had a very positive experience because 94.9% indicated that they would take another class by satellite.

Convenience is a big issue with the distance learner. If the class had not been offered by satellite, only 30% indicated that they would have taken a similar class on their own. In looking at the tuition issue, 40 students expressed a willingness to pay $90 tuition plus book expenses, 52 were not willing, and 13 secretaries did not respond. Out of the 15 classes by satellite, 90% of the students attended 12 or more of the broadcasts.

Finally, when asked to compare this class to a more traditional type of credit class, 60% reported that the class was better or as good as (18%, 42% respectively) other classes, 9% said not as good, and the remaining students could not make a legitimate comparison.

Measurements of Interaction.

Measurements of student/instructor and student/student interaction were obtained for this distance learning class.

Student/Instructor Interaction

* 105 electronic messages (e-mail) received by instructor from students via computer between 10/18/89 and 12/06/89. The average was .83 messages per student.

* Instructor's phone log had 144 phone calls, with an estimated 11 minutes of interaction per student.

* Phone interaction during satellite instruction averaged approximately 14 minutes per class, totaling 196 minutes of student/instructor interaction, or 1.54 minutes per student/instructor.

* Student/Instructor interaction during the five hours of face to face instruction at beginning and middle of the semester were not measured.

Student/Student Interaction

* 213 e-mail messages and/or files sent within electronic study groups to group members. Average of 17.75 communications per group.

* Participants estimate sending an average of 12 e-mail communications and/or file transfer to other classmates using individual unit ID's, not study group ID's.

* Nine audio teleconferences within 12 study groups, 30 minute average. 4.5 hours per group.

* Individual phone interaction between students not measured.

* Student/Student interaction during the five hours of face to face instruction at beginning and middle of semester not measured.

Students were asked to maintain logsheets on time spent on class assignments. With 83 of 127 students reporting, the average weekly time spent on class assignments was 4.86 hours (range was 1.8 hours to 8.3 hours).

Conclusions

Based on the evaluation data and cost analysis figures (not presented in this paper), delivery of the Office Procedures class by satellite and other technologies proved to be an efficient and effective way of providing professional development opportunities to the field secretaries of Virginia Cooperative Extension. This class, taught to 127 Extension professional secretaries across the Commonwealth, was evaluated very positively by the participants. The combination of technologies and methodologies employed in this distance learning activity were rated highly by the students.

Over 95% of the class had never taken a distance learning class, yet 95% responded that they would take another class by satellite, with almost 60% of the students reporting the class was as good or better than a traditional credit class. Based on this very positive response, additional credit and non-credit classes will be offered to secretaries and other professional staff in Virginia Cooperative Extension, utilizing satellite and other distance learning technologies.

DISTANCE LEARNING AND ACADEMIC POLICY
AN EXPANDING ROLE FOR CONTINUING EDUCATION

Don Olcott, Jr.
Assistant Director for Extended Learning Programs
Office of Continuing Higher Education (OCHE)
327 Snell Hall
Oregon State University
Corvallis, OR 97331-1633
503-737-1288

Introduction

The development of advanced communications technologies has transformed the capacity of higher education to deliver educational and training programs to nontraditional students. Today, colleges and universities are using a broad range of telecommunications media to transcend geographical boundaries and increase educational access to students across the nation. Common transmission technologies include satellite, microwave, ITFS, fiber optics, audio teleconferencing, audio graphics, and other computer information systems (U. S. Congress, OTA, 1989, & Olcott, 1988).

The proliferation of institutions engaged in distance learning has created a need for more flexible and responsive academic policies. Issues such as academic quality, faculty incentives, instructional and student support services, program budgeting, residency, copyright, program evaluation, and a host of other issues permeate the literature on distance education. Extended learning has emerged as a powerful force in higher education as evidenced by this rapid growth in telecommunications delivered programs. Nowhere have these changes created more opportunities, and more challenges than for continuing education professionals.

Until recently, continuing education's primary responsibility for distance learning focused on the provision of administrative and related support services. Today, continuing education professionals are serving in liaison capacities between faculty and administration and participating in the development and implementation of distance learning academic policies. Their unique expertise with adult students, coupled with their experience in administering extended programs, is proving invaluable as institutional leaders reassess their academic polices for implementing distance learning programs.

This paper discusses practical strategies designed to enhance the role of continuing education professionals in the development and implementation of distance learning academic policy. These strategies are equally applicable for campus-based academic policy. A preliminary model under consideration at Oregon State University is briefly outlined. Future roles for continuing education in distance learning will also be examined. The development of this paper is based on three basic premises. These include:

1. Faculty participation and support are essential for developing effective distance learning programs.

2. Distance learning must be consistent with the institutional mission and the mission of individual academic units. Support from central administration, Deans, Directors, and other key players is essential for maintaining this consistency.

3. The capacity of continuing education to gain faculty acceptance of distance learning will be influenced by the credibility of continuing education among institutional faculty.

Strategies for Continuing Educators

Enhancing Your Credibility with Faculty

- Recognize that the fundamental purpose of colleges and universities is an *academic mission.*
- Develop a knowledge and understanding of institutional and system-wide curricular guidelines. What are the procedures for program approval? What curricular bodies review extended programs? How long is the normal review process? What issues have historically been problematic?
- Explore opportunities for instructional roles. Teaching courses, conducting research, publishing, attending AAUP meetings, presenting papers, and attending Faculty Senate meetings will enhance your credibility with faculty.
- Develop a sound knowledge and understanding of faculty concerns and issues. How do these either facilitate or inhibit distance learning?
- Know the history of technology on your campus. What obstacles have inhibited faculty participation in the use of mediated instruction?
- Examine promotion and tenure guidelines for each college. How does distance learning teaching conflict or accommodate these? What factors are problematic? What polices govern inload vs overload teaching assignments?
- Know your faculty! What are their areas of expertise? Do they have experience in distance teaching via technology? How are they viewed by their peers? Are they influential in decision making? What incentives are most important? (Edelson, 1990)
- Know the mission of your institution and how each college "fits" into that mission. Is extended learning part of that mission?

Communication and Administrative Strategies

- Emphasize that distance learning is an instructional alternative. It is not a panacea for all instructional problems, nor is it appropriate for all programs or audiences.
- Develop expertise in the following areas:
  - Policy issues (e.g., residency, inload vs. overload, copyright, instructional control and support, etc.). Know how these issues are being resolved at other institutions.
  - Institutional media resources for distance learning.
  - Availability of faculty and student support services.
  - Faculty training opportunities.
  - Costs.
  - Incentives and rewards.
- Be familiar with the research and literature on distance education with particular emphasis on evaluation, instructional design, and innovative strategies for maintaining academic quality. What are the advantages and problems that have emerged? (Keegan, 1986)

- Develop ongoing liaisons with the following:
  - Individual faculty
  - Faculty Senate
  - Central Administration
  - Graduate School
  - Student Affairs Offices
  - Business Office
  - Media Center
  - Campus AAUP Representative
  - Deans, Directors, and Department Chairs
  - Library
  - Interinstitutional contacts
- Recognize the power of history and tradition on your campus. What are the "shared values" of the institution in general (Peters & Waterman, 1982).
- Assess the organizational cultures across your institution. How do things really get done? Who has the power and influence? How are decisions made? Who (individually and organizationally) controls the allocation of resources? (Edelson, 1990, & Pfeffer, 1981)
- Pay attention to the language you use to communicate continuing education's role. Most continuing education units do not provide direct instruction. Rather they administer and coordinate instruction through individual academic units. Administered through vs. offered by are not synonymous.
- Continuously engage in strategic planning. There is no substitute for effective planning, particularly for distance learning programs (Simerly, 1987).
- Remember that you are, in effect, a change agent. You are attempting to diffuse an innovation among your faculty. *The innovation is the practice or process of learning from a distance.* Though hardware or individual mediums can be viewed as separate innovation- diffusion processes, this places the focus on the technology rather than the process (Rogers, 1983).
- Academic quality and standards! If there is one universal issue among faculty, administrators, and students, it is the quality level of distance learning programs. This should guide your efforts as you engage in the academic policy development process (OTA, 1989).

A Preliminary Model for Continuing Education

A preliminary model for enhancing continuing education's role in policy development is provided in Figure 1. This model is currently under consideration at Oregon State University and will most likely be modified. As you review the model, keep in mind the strategies discussed in the previous section and how those strategies are dependent on the creation of campus linkages. The model has been created in response to the creation of Oregon Ed-Net, a statewide telecommunications network scheduled to begin September 1990 (See Appendix A). A few highlights of the model include:

1. The joint administration of OSU distance learning by the Office of Continuing Higher Education and the Communications Media Center. The OSU Ed-Net coordinator reports to the Directors of OCHE and CMC, who in turn report to the Provost.

Preliminary Model

Distance Learning Administration

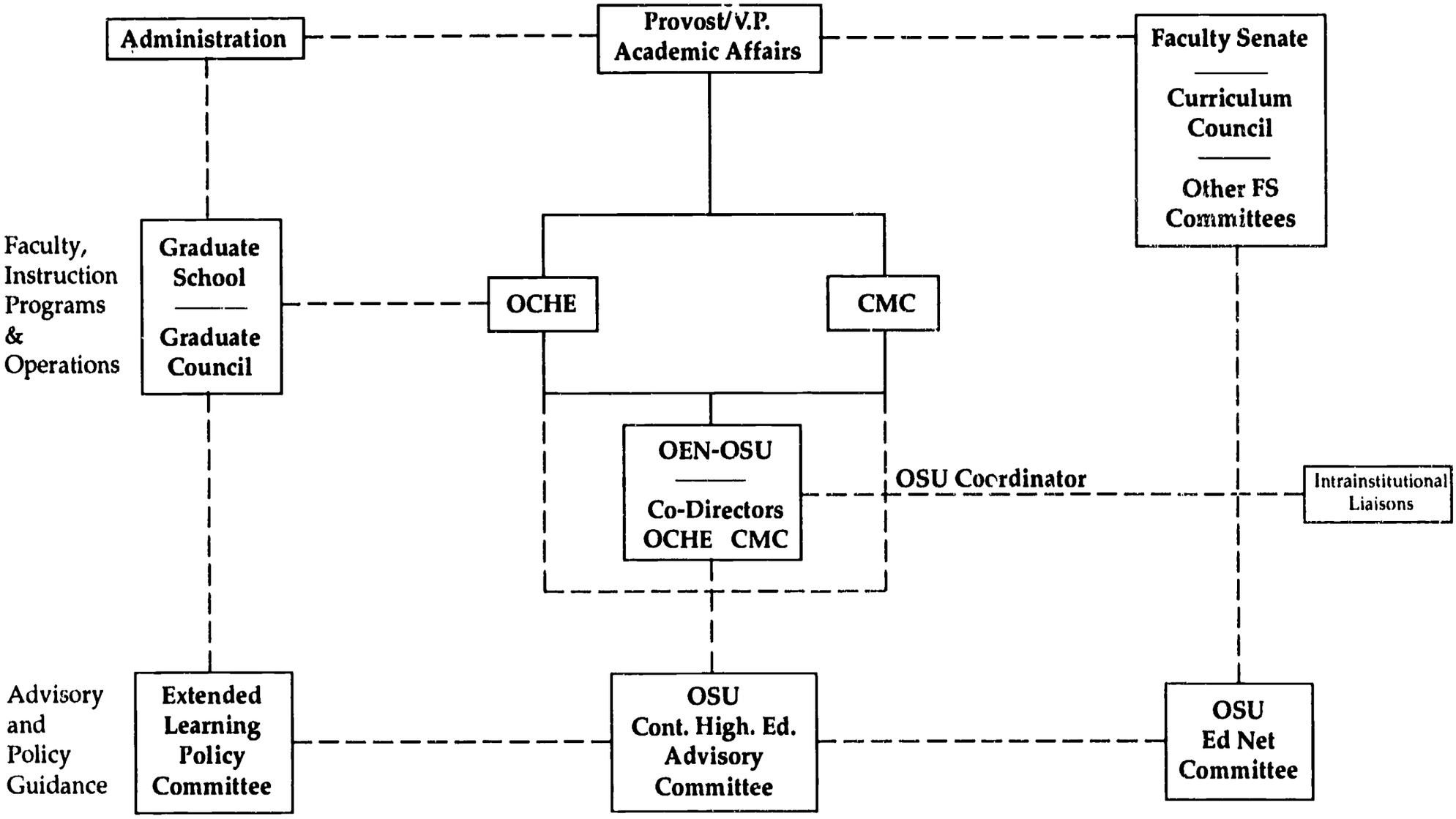


Figure 1

2. OCHE and CMC have extensive liaisons with the primary curricular bodies and offices responsible for the development and approval of academic policies. The model provides essential linkages between continuing education and academic curricular bodies. This framework has been instrumental in initiating and fostering liaisons with individual faculty and for promoting distance learning at OSU.

Summary

Distance learning provides unique opportunities for colleges and universities to extend their academic programs. Flexible and responsive academic policies will not guarantee effective distance learning programs. They will, however, provide a basic framework from which to modify and enhance distance learning programs that meet the needs of faculty and distance learners.

What are the future roles for continuing education?

- Enhanced role in distance learning policy development.
- Stronger liaisons and influence with campus curricular bodies
- Interinstitutional coordination of distance learning programming.
- Institutional and systemwide strategic planning.
- Program evaluation and distance learning research.
- Program budgeting.
- Coordinate and advocate noninstructional uses of telecommunications media.
- Consultant to faculty and administration.
- Advocate of academic quality for all extended programs.

As for the future of distance learning, Gross and English (1989) sum it up best. They write:

> We can build the pipeline, and we can make policies concerning how the pipeline will be used. But the true test of success will be the quality of what flows through the pipe and the benefits accrued by those at the other end. Educational telecommunications promises to be a tremendous tool in enhancing educational opportunity; but in the final analysis of this technology, as in all other technologies that have preceded it, it will be the educational content, that interaction between the "teacher" and the "student" that will be the real measure of success. (Gross & English, p. 41)

APPENDIX A

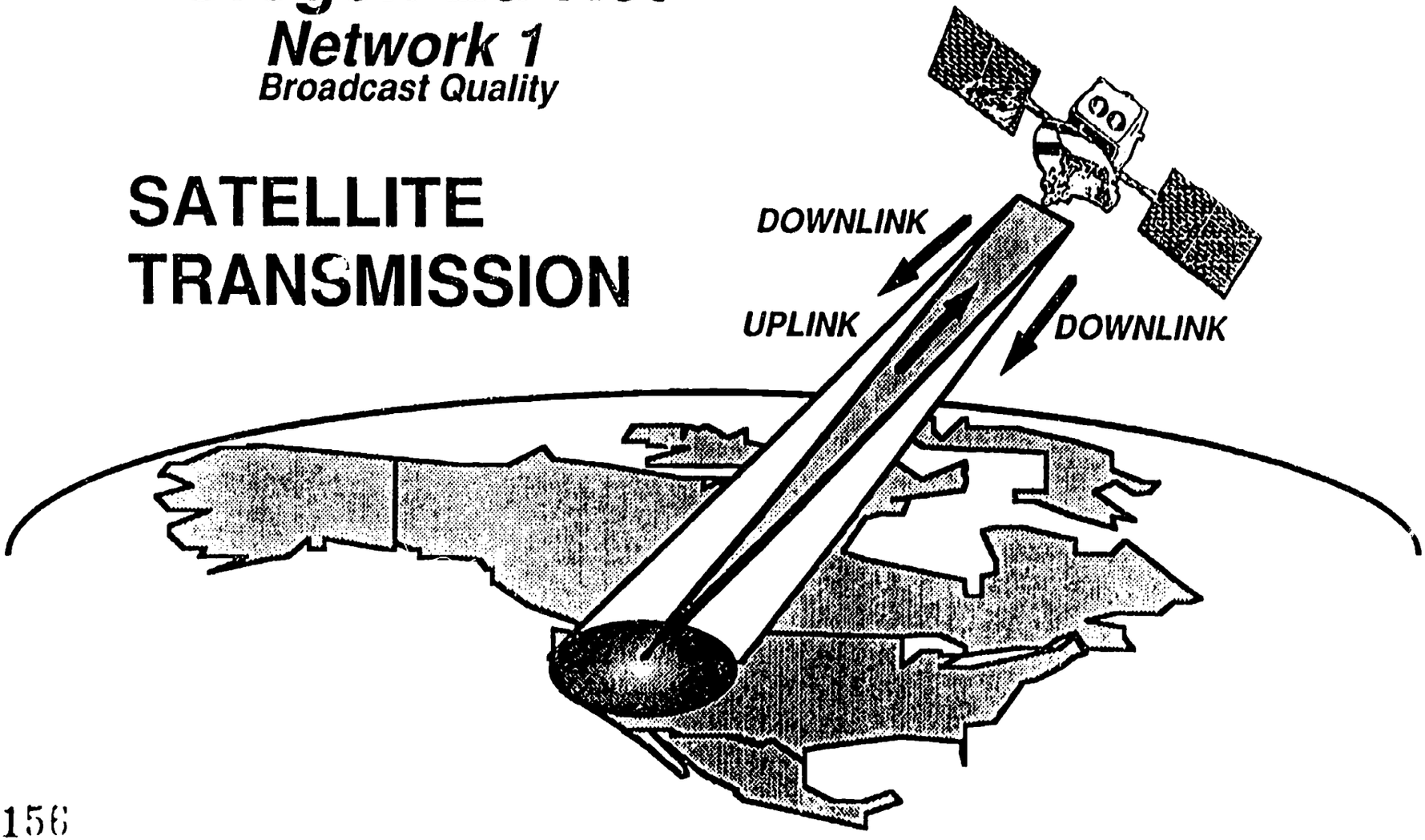
OREGON ED-NET

Oregon Ed-Net

Network 1

Broadcast Quality

SATELLITE TRANSMISSION



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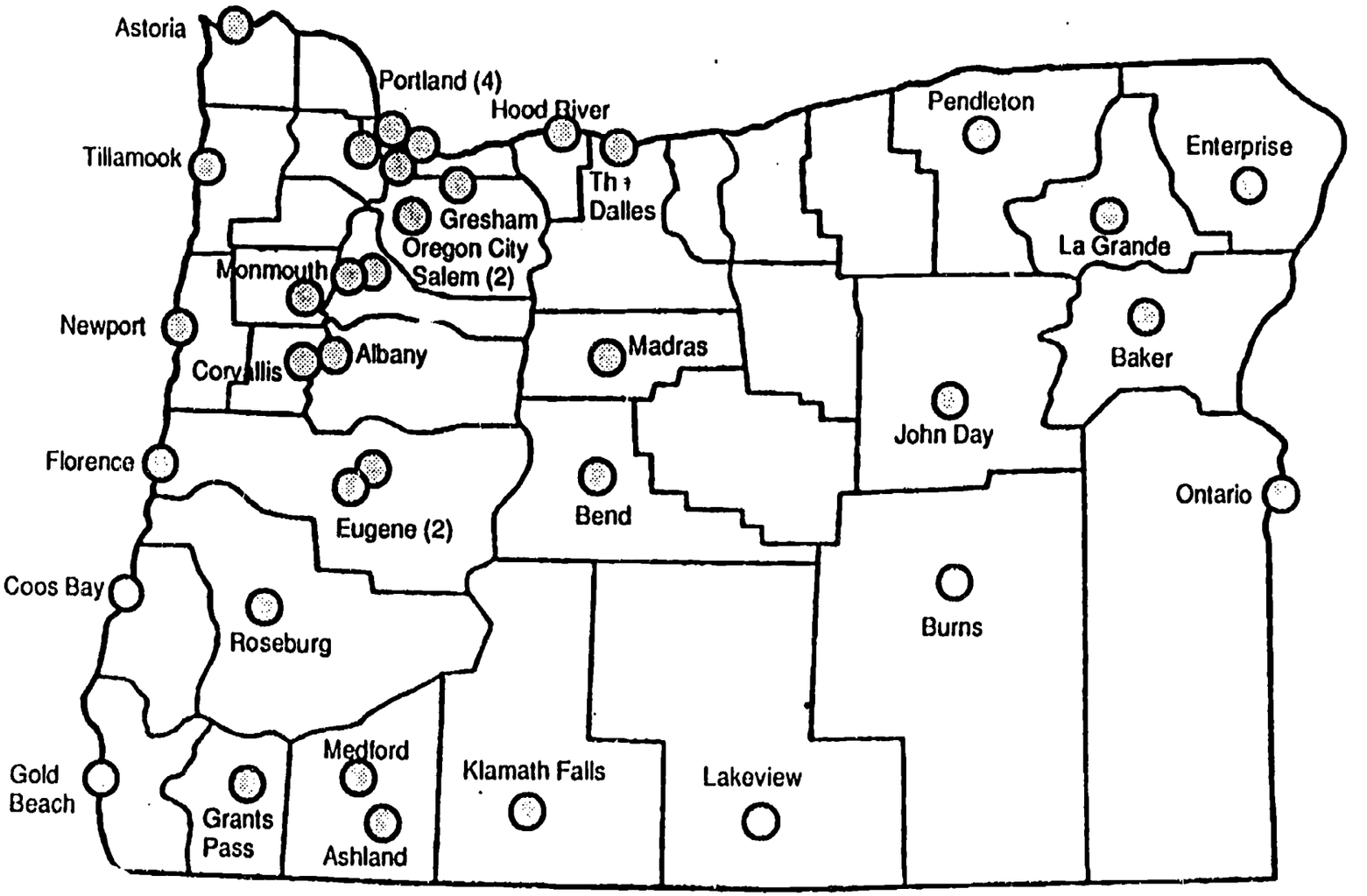
OREGON ED-NET
Network 2
Compressed Video Origination and Receive Points



OTwo-way compressed video origination points

Network I	One available channel One way video - two way audio Can deliver Net II programs Over 700 receive locations Broadcast video quality
Network II	30 available channels 2 way video & audio capable satellite based 39 send / receive locations ,*compressed video signal*
Network III	Audio & data only Land line based Libraries will interconnect
Other Resources	ITFS in Portland Microwave Interconnection Limited to Willamete Valley and Portland locations Institutions must purchase own hook-up Two-way video & audio capable Interconnects with ITFS in Portland Broadcast video quality Possible cable connections

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UTILIZING ITFS AND PUBLIC TELEVISION TO MEET SOCIAL CHALLENGES FACING ADOLESCENTS IN THE 21ST CENTURY

Lynn R. Wallich, Ph.D.
Associate Director
School Services Bureau
University of Wisconsin - Green Bay

Eileen Littig, M.S.
Director
NEWIST (Northeastern Wisconsin In School Telecommunications)
CESA 7
(NEWIST is located at the University of Wisconsin - Green Bay)

Adolescents are ranked among the nation's "at-risk" groups. Developmentally, they are in a state of flux with a serious strain placed on their decision making capabilities relative to social and moral issues. Often adolescents are provided with very little information on critical social issues and more often than not, they are provided with the wrong information relative to these issues. Challenges on how these issues can be accurately addressed are constantly faced by parents, teachers, and adolescents themselves.

The purpose of this paper is to discuss the use of distance learning, e.g., ITFS and public television as mediums in addressing critical social and developmental issues for adolescents. "Time to Talk" broadcast over ITFS and "Teen Connection" broadcast over public television were developed by the presenters specifically to dispel myths and provide accurate information on social problems faced by teens.

As one works through various stages in their life, it is often too easy to forget the trauma associated with adolescence. Parents of young teens question what happened to the innocent, loving, soft-spoken child leaving grade school who actually wanted to spend time with the family. Adolescents themselves, question everything that is happening in their lives. It is a time in their lives when they are particularly vulnerable. According to Erik Erikson's psychosocial theory of development, people pass through various stages as they go through social and emotional change. Adolescents face the conflict of "identity" versus "role confusion". Erikson also states that resolution of earlier conflicts will serve as a foundation for the search for identity.

How the adolescent established a sense of trust, autonomy, initiative, and industry will assist in determining how the adolescent will establish identity. Answering the question "Who am I" can be vary traumatic since is refers to the organization of the adolescent's drives, abilities, beliefs, and history into a stable image of self. Choices and decisions need to be addressed which focus on sexual orientation, vocation, and general life philosophy or values. If the adolescent cannot make

choices or decisions with some degree of confidence, then role confusion threatens.

Exactly what happens to the adolescent when faced with difficult decisions is dependent on the availability of resources. Keeping in mind that it is also during this time in the adolescent's life that the family is not as significant as the peer group, often the peer group is the first available resource an adolescent will turn to for information. Teachers and guidance personnel are also looked upon as resources, however, a dilemma occurs when many issues which adolescents face are issues that classroom teachers and guidance personnel are not comfortable in discussing. Examples of such issues are sexual orientation, homophobia, eating disorders, suicide, teen pregnancy, depression, AIDS, sexually transmitted diseases, risk taking, and drug abuse.

Societal expectations have put pressure on school systems to begin addressing adolescent issues. On June 9, 1990, the New York Times cited a national commission report stating that exessive drinking, drug use, sex and violence are major threats to the current generation. More than half of all high school seniors become drunk once a month. This is a problem schools need to address. However, institutions which prepare educators do not necessarily address these issues within the teacher prep programs. School systems as well, do not necessarily place monies in staff development programs which would assist teachers and guidance personnel in addressing these concerns. The lack of preparation often leads to staff feeling uneasy in assisting adolescents with decision making or providing them with accurate information.

Since the first resource is usually the peer group, a major concern is accurate information. More often than not, peer groups are misinformed, mainly because they receive their information from each other. Since misinformation can be fatal, as in addressing the HIV virus, an avenue for students to turn to receive accurate information and still maintain autonomy is critical. It needs to be noted that well trained peer leaders have proven to be a very effective as an intervention resource for younger adolescents.

In an article entitled "Social Issues The New Curriculum", various educational mediums were discussed relative to their efficacy in motivating and changing the behavior of youth. Besides presenting materials which are factual, updated, understandable, and are interesting, it was pointed out that students love the media, especially video. Having a variety of media in the classroom setting guarantees that an educator will cover the range of learning styles (Williams, 1988).

Recognizing that the use of media is effective and that not all school districts have the capabilities to hire experts which address crucial social issues, two programs were developed which

focused on adolescent issues and took advantage of distance learning. "Time to Talk" which is a live televised program over the ITFS (Instructional Television Fixed Service) and "Teen Connection", a live televised program over public television were created to dispel myths and provide accurate information on critical social issues adolescents are confronted with today.

Both "Time to Talk" and "Teen Connection" offer expert advice on social issues via a panel of people (inclusive of adolescents) selected from state and local agencies. Each panel member is selected based on their level of expertise regarding a specific topic. A panel could consist of 3 to 6 people with and adult facilitator.

"Teen Connection" , a 60 - minute live call-in television program for teens was initiated on May 18, 1988 on Channel 38, WPNE, a Wisconsin Public Television station and was produced by Northeastern Wisconsin In-School Telecommunications (NEWIST/CESA #7) Center for Television Production, University of Wisconsin-Green Bay, Brown County Teen Task Force, and the Center for Public Representation, Madison.

The Center for Public Representation, Madison, had a federal grant on Adolescent Access to Health and organized 4 youth speakouts throughout the state in order to gain an adolescent perspective on problems and barriers faced by teens in obtaining health and mental health services. In the Brown County Area, the Brown County Teen Task Force decided they wanted to broadcast a live call-in program on Channel 38, WPNE, with teen panelists providing on-air information as well as teens answering and responding to phone calls. Phone calls from the viewing audience are taken live on the air and answered immediately by the teen panel, an adult prevention counselor, and a host on the program.

Youth were involved in the planning and identified the topics to be discussed. Topics addressed on "Teen Connection" include "Communicating with Parents", "Road Cruising: Teens, Driving, and Alcohol", "Teens and Aids", and "Drugs and Violence". Panelists on each show make a brief presentation regarding each topic and then the program is opened to the viewing audience.

Producers of "Teen Connection" learned that an anonymous call-in program on television was an effective way to provide information about adolescent issues and that teens educating and reaching out to teens is also very effective.

"Time to Talk" is a 60-minute live call-in television program broadcast over the Instructional Television Fixed Service (ITFS) in Green Bay. This program was initiated during the Fall of 1988 with the pilot program viewed in February of 1989. The program is broadcast during the lunch hour on a monthly basis and addresses issues facing teens. It is fed into the Green Bay Schools and 15 outlying school districts that are members of the Northeast Wisconsin Telecommunications Education Consortium

(NEWTEC)/CESA #7.

Southwest High School in Green Bay is the studio site for the broadcast. Students may bring a bag lunch and sit in the studio to participate in the program. Technologically, ITFS utilizes one-way video, two-way audio. Students in outlying schools can receive immediate feedback and ask questions through the use of a phone bridge.

Topics addressed during the pilot year included coping with stress and depression, teen suicide, date rape, sexual harassment, risk-taking behaviors, and eating disorders. During the 1989/90 academic year, "Time to Talk" addressed the issues of coping with divorce, satanism, school, drugs, and sports, intergenerational communication, homophobia/sexual orientation, racism, safe sexual decisions, alcohol and the family, and entrepreneurship.

Tapes of "Time to Talk" programs are available to the consortium schools to be used and discussed with classes who could not view the program live. Copyright deadlines vary with the typical cancellation date being one week after the initial broadcast. Typically, programs have been used in health as well as sociology classes.

Both "Teen Connection" and "Time to Talk" end with a listing of available resources relative to the topic where students can go or contact for further information. Most of the topics addressed on both programs are areas which create trauma is the lives of adolescents. Therefore, it is crucial that assistance is available for follow up if needed. Peer counselors are available in some school districts, however, outside references are very important so students can retain a degree of autonomy.

Reiteration of the primary goal of both of these programs is to dispel myths and provide accurate information on social issues faced by teens today through the use of distance learning. Distance learning is not only a cost saving vehicle but also a vehicle which allows topics to be discussed with candor. Teen panelists, as well as experts, are open and honest and are not influenced by status or position. They "tell it like it is" based on their actual experience. Distance learning provides information to all who wish to participate. It is an avenue which does not discriminate among its audience nor among the community it provides access to.

Armed with accurate information, adolescents can become empowered to take control over the decisions they make in their life. This critical time in the lives of teens is a time when they need access to information without being judged. It is also a time when they need advocacy. Adults acting on behalf of their best interests by not being judgmental. Adolescents need access to supportive resources. "Teen Connection" and "Time to Talk" can provide these resources.

TRAINING DISTANCE EDUCATORS FOR CONVERGING TECHNOLOGIES

FARHAD SABA, Ph. D.
PROFESSOR OF EDUCATIONAL TECHNOLOGY
SAN DIEGO STATE UNIVERSITY

Purpose

This presentation is to describe how future instructional designers are trained at the Department of Educational Technology, San Diego State University to use integrated data-voice-video desktop workstations for distance education. characteristics of converging technologies will be examined in light of recent technical changes. It will be demonstrated how students use HyperCard to create authoring shells and Timbuktu for delivering instruction on integrated workstations. Also, it is described how students investigate and analyze selected topics related to current theories, research methods, evaluation strategies and current issues in distance education.

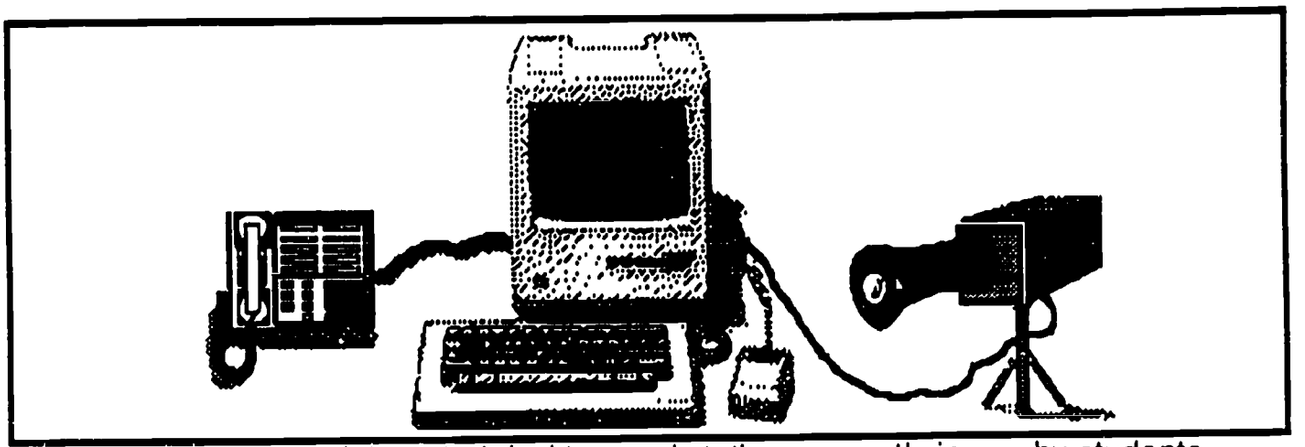

Figure 1. A prototype integrated desktop workstation, currently in use by students at the Department of Educational Technology, San Diego State University.

An Emerging Technology

With the new integrated information technology a teacher or a trainer can offer distance education services to learners from a desktop workstation. Through newly developed systems the instructor and the learner can communicate with data, voice, text, graphics and video. (Saba and Twitchell, 1988). The teacher and the learner can talk to each other; work on the same computer file (screenshare), exchange data; and with the expansion of broadband telephony, eventually, see each other. Figure 1 shows a prototype integrated workstation, currently in use by students in the Department of Educational Technology at San Diego State University. The instructor workstation is consisted of a telephone with a speaker to provide hands-free operation, a black and white video camera, a video monitor (not shown in Figure 1, as

it is expected that the video and the computer screens converge in a near future) and a Macintosh SE/30. The instructor workstation can be augmented with a video playback unit to show video clips to the learner. The leaner workstation is identical to the instructor workstation, except that it dose not include a video playback unit. The instructor and the learner workstations are connected by hard wire. This, however, dose not affect teaching of instructional design principles for integrated systems, as the wiring is transparent to students and future integrated telecommunications systems is effectively simulated with existing technology. Thus, with a relatively inexpensive prototype system students are trained to use a technology which is bound to become popular in the 1990's.

It is expected that within the next three years, integrated desktop workstations be connected to each other by existing telephone lines, thus eliminating the need for very expensive telecommunications systems such as coaxial cable, microwave, or satellite. New telecommunications standards such as Integrated Services Digital Networks (ISDN) offer the possibility of transmitting data, voice, text, and eventually video through the telephone line. ISDN will provide bi-directional, interactive and synchronous telecommunications between the teacher and several learners, who may be in different geographical locations.

An Emerging Need

Trained educators who are familiar with theoretical and practical aspects of converging technologies will be needed to design instruction for integrated systems for use by learners in public schools, in the private sector and at home.

They should be able to:

- Design programs for converging technologies,
- Be able to use converging technologies to deliver instruction,
- Provide support services to distant learners via convergent systems,
- Conduct evaluation and research studies on distance education concepts, models and programs and
- Analyze the impact of new information technologies on education and schooling.

A Response To The Need And The Technology

In the Department of Educational Technology at San Diego State University, students are learning how to use an integrated desktop workstation to design, produce and present telelessons. They use HyperCard to create authoring shells and Timbuktu to deliver instruction. Furthermore, they are engaged in learning activities that allow them to become familiar with theories of distance education, research and evaluation methods in distance education and current issues in the impact of new

telecommunications technology on education. Course objectives include:

1. Identify various parts of a typical integrated desktop workstation and describe the function of each part.
2. Use a desktop workstation to establish bi-directional, synchronous and *shared voice* , *computing* and *video* telecommunications with another desktop workstation.
5. Develop an authoring shell in HyperCard.
7. Develop and present a telelesson via Timbuktu with HyperCard.
8. investigate a current issue in theory of distance education, or in research and evaluation methodology, or in the impact of new information technology on education.
9. Write a report on the results of investigation and make an oral presentation to the class.

Course Activities

EDTEC 700, Seminar in Educational Technology: Distance Education, is a graduate course. (Seidman, 1989). Those students who have completed at least one course in three areas of instructional design, educational broadcasting, and hypermedia production can enter the course. Through a series of demonstrations and laboratory exercises, students receive hands-on instruction on how to use the voice, video and computing features of the desktop workstation; and establish and maintain communications with at least one remote desktop workstation. As students are already familiar with the use of HyperCard (Allen, Dodge and Saba, 1990) and have learned how to produce and use video clips in prior courses, they can quickly learn how to use the desktop workstation for establishing bi-directional and synchronous communications with their learner working at a remote desktop workstation. The only new feature to them is Timbuktu, a communications software that enables the instructor to share his/her hard disk drive with the learner for a variety of different computing purposes, including screensharing and file transfer. Timbuktu is a user friendly software and its use becomes transparent to both the instructor and the learner after a few minutes from initial exposure.

Once students have become familiar with basic communications and computing features of the workstation, they form groups of 3 to five. They are provided with instructional design guidelines to produce a HyperCard shell as an authoring template for designing, developing and presenting telelessons; or for managing on-line instructional systems. Within the confines of the guidelines, students are encouraged to use their creative talents to include features in the template that would help them to strike an appropriate balance between *dialog* and *structure* , (Moore, 1983; Saba, 1988) as well as to maintain good communications with learners for administrative and counseling purposes. Figure 2 shows a card of a sample stack created for authoring of telelessons. Figure 3 shows the menu of a HyperCard stack created for the management of an on-line instructional system.

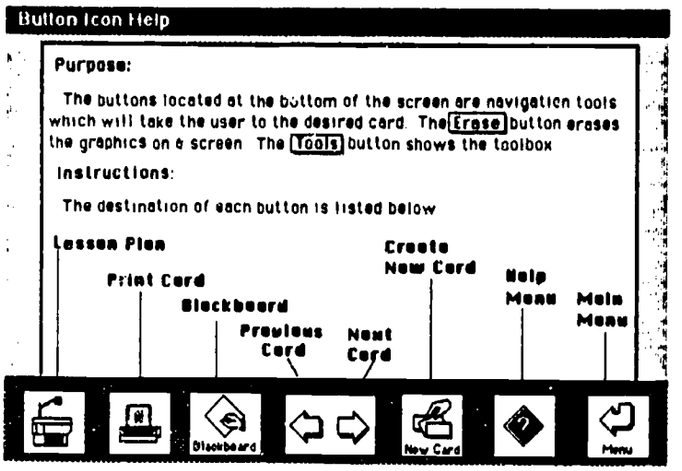

Figure 2. A sample card of an authoring template in HyperCard for distance instruction.

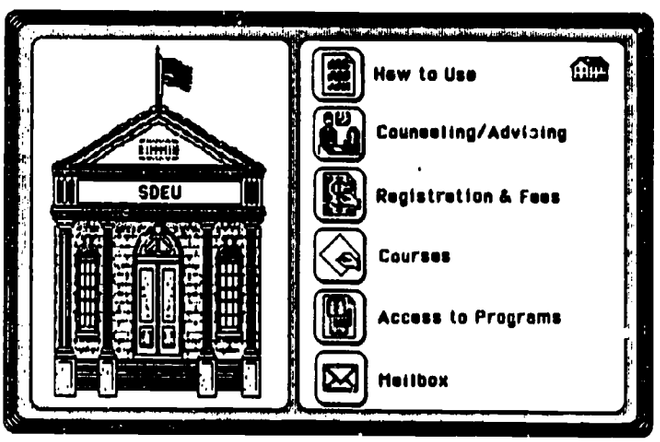

Figure 3. Main menu of a HyperCard stack created for management of a prototype on-line instructional system.

Authoring template are presented in class by each group. Students receive feedback from their peers and the instructor on strengths and weaknesses of each approach. Once the templates are refined, each student selects a content area, or an administrative/counseling procedure for designing, developing and presenting a telelesson; or an administrative procedure. Final projects are delivered "live" and on-line as students teach their learners a combination of facts, concept, procedures, rules, principles or theories related to the selected content area. As students are free to experiment with a wide variety of content areas, final projects have ranged from teaching techniques of shot composition with a video camera, to administering acupuncture. Final projects are evaluated by the instructor as each student delivers his/her program. The evaluation form contains criteria related to macro instructional design, micro design (text, graphics, audio, video), establishing and maintaining technical communications, balancing dialog and structure and evaluating the learner.

In addition to preparing students to use integrated telecommunications systems, the course is design to develop students' analytical skills for developing a comprehensive understanding of current theories, research methods, evaluation strategies and current issues in distance education. Based on class lectures, a set of reading materials (Moore and Clark, 1989) and other publications each student selects an area of interest for investigation. Students receive individual consultation by instructor as they proceed in collecting information about their topics. Towards the end of the semester, each student makes an oral presentation to the class, based on a written report. Presentations are followed by class discussion. In the past two years, students have studied a variety of topics ranging from concepts of distance education, distance education organizations and distance education in the international arena to future technologies and telecommuting.

Students' Response

EDTEC 700, has been offered on an experimental basis for the past tow years. Each year, students have received it with enthusiasm, dedication and hard work. They feel they are contributing to the future development of the field of distance education by developing and presenting demonstration projects on a new technology. Because of its success, the Department is currently considering the adoption of the course on a regular schedule.

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DISTANCE TEACHING ACROSS CULTURES: IMPLICATIONS FOR INSTRUCTIONAL DESIGN

David W. Conner
Extension and Continuing Education
Wheaton College, Wheaton, IL

Introduction

The challenge of the "global classroom" is now upon us. As never before, distance educators are engaging learners from all over the world--employing numerous technologies in a variety of formats (Niemi and Gooler 1987). The result is an encounter with an ever-increasing number of culturally-diverse learners the likes of which many in the field have never had opportunity to interact with before.

This encounter poses a unique challenge to those involved in the design and development of instruction for use at a distance, namely: how to effectively design and develop appropriate instruction for culturally-diverse distance learners. This is one of the primary challenges the "global classroom" has placed before us.

The Design and Development of Culturally-Appropriate Instruction: A Review of the Literature

A review of the literature reveals three trends. The dominant trend is that the unique cultural characteristics and contexts of culturally-diverse learners have been totally ignored. A review of the standard texts in the field (Gagne et al 1988, Dick and Carey 1985, and Kemp 1985) reveals little, if any, discussion on how to address the needs of culturally-diverse learners. This void indicates that leaders in the field such as these have yet to come to grips with the unique demands of the "global classroom".

A secondary trend revealed in the literature is that of adapting or modifying instruction so as to make it as culturally appropriate as possible. This trend is represented in the efforts of Hites *et al* (1988, 1986, 1984), who make a number of suggestions for adapting/modifying instruction for learners from other cultures. These include ways to ensure that all learners have at least a moderate amount of language proficiency, ways to simplify both spoken and written English, the use of culturally-appropriate visuals to overcome language problems, and ways to make examples and analogies culturally relevant.

In addition to Hites *et al*, Trollip and Brown (1987) suggest both a methodology as well as general issues of preparing instructional software for easy translation into other languages. Parker (1988) provides a compendium of practical guidelines for making illustrations culturally relevant.

Finally, a tertiary trend found in the literature is best represented in the work of Pomerville (1976). His efforts represent one of the most significant attempts to design and develop culturally-appropriate instruction documented to date. Simply put, Pomerville conceives of the audience analysis component of the instructional design and development process so as to include both the "deep structure" (e.g. values, learning styles, etc.) and "surface level" (e.g., language spoken, forms of polite interaction, etc.) characteristics of learners' cultures. This means that in addition to a learner's culture-specific characteristics, the learner's worldview and its impact on the design and development of instruction are also seriously considered.

Efforts like that of Pomerville give significant attention to the cultural contexts of individual learners and the impact those have on their abilities to learn across cultural boundaries. They, in turn, bring to light the shortcomings of those efforts comprising the secondary trend revealed in the literature: that of merely adapting/modifying instruction. Such efforts tend to be purely "cosmetic". Primarily linguistic in nature, they tend to neglect the "cultural subtleties and deep-rooted value systems that are fundamental to education in any country" (Ely 1989). Other approaches to the design and development of instruction for culturally-diverse learners sharing Pomerville's concerns include those of Bowen and Bowen (1989), Ely (1989), Bell (1986), McKinney (1984), Butterfield (1983), and Smart (1983).

The Need for a Multi-Disciplinary Approach

Hidden between the lines of the preceding literature review is the call for a multi-disciplinary approach to the design and development of instruction for culturally-diverse learners. A review of the dominant trend revealed indicates that the major players in the field of instructional design are relatively ignorant of the unique needs of culturally-diverse learners, and the means to address these needs. Despite an attempt to make adjustments on behalf of such learners, the secondary trend revealed in the literature also falls short of its goal. Interestingly enough, the literature cited representing both of these trends is written by professionals specifically trained in the field of instructional design and development.

The literature cited representing the tertiary trend, however, is written by professionals from a variety of disciplines: adult education, anthropology, cross-cultural training, intercultural communication, missiology, and multicultural education, as well as instructional design and development. The fact that these professionals address both the surface level and the deep structural level needs of culturally-diverse learners suggests the importance of a multi-disciplinary approach to such an endeavor. The contributions these various disciplines make to the design and development of culturally-appropriate instruction are many-fold. A few are worth mentioning at this point.

Contributions from Intercultural Communication: It is well-documented that most distance education programs employ a "systems" approach to the design and development of instruction (Purdy 1986). Such an approach is based on a number of theoretical assumptions, not the least of which is the ability of the instructor/instruction to "successfully" communicate with the learner (Gagne et al 1988). This means that the transmission of a message (knowledge, skills, attitudes) between sender (instructor/instruction) and receiver (learner) results not only in the attention to, but the comprehension and the retention of, the intended message (Sogaard 1975).

In the case of designing and developing instruction for learners of the same or similar cultural backgrounds, such a "given" can usually be assumed. However, in the "global classroom" of culturally-diverse learners, it cannot. According to Vergara (1986), "Cultural factors do make a difference in the degree to which a people understand a message transmitted via any given communication medium." Thus, unless adequately accounted for, these factors are apt to interrupt or interfere with the communication processes required to facilitate effective and culturally-appropriate instruction.

Contributions from Anthropology and Cross-Cultural Psychology: Culture has been defined as "the integrated system of learned patterns of behavior, ideas, and products characteristic of a society" (Hiebert 1983). The impact of this integrated system on the ability of individuals to learn, especially across cultural boundaries, is well documented (Bennett 1990, LeSourd 1990, and Bell

1986). Therefore, it should come as no surprise that culture also impacts the design and development of instruction for use by culturally-diverse learners.

Individual differences among culturally-diverse learners that affect learning include learning styles; the need for structure; learning skills; aptitudes and achievement; motivation; self-concept; interests; physical attributes; peer relationships; family conditions; values, attitudes, and beliefs; and the sense of one's ethnic identity (Bennett 1990).

The impact of culture on individual learning styles has been of particular interest to educators, especially as it has been studied along the *field-dependent / field-independent continuum.* The implications of this continuum for the design of culturally-appropriate instruction have been well documented (Bennett 1990, Ehrman 1990, Bowen and Bowen 1989, Witkin et al 1977).

An understanding of the impact of culture on learners' values, attitudes, and beliefs has also been of particular interest to educators working across cultural boundaries. These values, attitudes, and beliefs are the basis for a learner's *worldview.* The implications of worldview differences for the design and development of culturally-appropriate instruction also appear throughout the literature (Cobern 1988, McKenzie 1987, Kraft 1974).

Finally, there are several major dimensions that contrast cultures worth noting. These include the individualism-collectivism dimension (Triandis 1987, Hofstede 1986), power distance, uncertainty avoidance, and the masculinity-femininity dimensions (Hofstede 1986), and the distinction between *high-context* and *low-context* cultures (Hall 1989, Plueddemann and Plueddemann 1990). Each of these major dimensions suggest implications for the design and development of culturally-appropriate instruction learners. They should be further explored as a result.

Contributions from Adult Education and Missiology: One of the primary principles upon which adult education is based is that of knowing and understanding the characteristics and needs of the adult learner. Cross (1981) argues that most learning theories are irrelevant because of their lack of attention to the learner, conceding that unfortunately "Most existing learning theories are more easily applied to *what* is learned than to *who* is doing the learning..." She therefore admonishes her colleagues to give their undivided attention to the "special characteristics of adult learners and the context in which learning takes place." Those involved with the design and development of instruction for culturally-diverse learners would do well to do the same.

Participation is a second principle espoused by adult educators which when practiced can greatly increase the probability of designing and developing culturally-appropriate instruction. Both Gueulette (1986) and Butterfield (1983) argue for the participation of culturally-diverse learners in conducting their own needs assessments. Stolovitch (1982), on the other hand, employs what he terms "learner verification and revision" (LVR). Through this procedure he enrolls the participation of culturally-diverse learners in order to ensure successful formative evaluations and materials adaptations. Enlisting culturally-diverse learners in the design and development process itself would go a long way in creating culturally-appropriate instruction.

A final contribution worth noting comes from the field of missiology. Here McKinney (1984) recommends that instruction can best be "contextualized" when the methods and media selected and employed are those which can be loaded with cultural content by the learners themselves. Such methods include case study, role play, self-directed learning activities, and the frequent use of the inductive method. Examples of media include those which, according to Dale's Cone of Experience (see Knowles 1980), align with the learners' cultural preference for certain types of sensory experiences. Again, the implications for instructional designers and developers is obvious: let the learner take the lead in "contextualizing" the instruction as much as possible.

Recommendations

This paper has proposed a strategy for effectively designing and developing appropriate instruction for culturally diverse learners. A review of the literature has demonstrated three things. First, that the instructional design field itself has conducted too little research on the topic. Second, that "cosmetic" efforts to adapt/modify instruction for culturally-diverse learners represent a good start, but an insufficient finish. And third, that a multi-disciplinary approach to the problem appears to elicit the most insight and motivation in tackling the task at hand: the design and development of culturally-appropriate instruction. In light of these findings, the following recommendations are offered.

1. Professionals within the field (distance educators included) should acknowledge their failure to adequately address the unique learning needs of culturally-diverse learners. Specific plans to reverse such failure should be established.

2. Culture-general training of a multi-disciplinary nature should be provided to and required of all those studying to work in the field of instructional design and development.

3. This culture-general training should be supplemented with culture-specific input from a representative of the specific culture from which a design and development project's target audience comes.

4. And finally, culturally-diverse learners should ultimately be trained and empowered to design and develop instruction relevant to their own cultures.

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USING AUDIOTAPES AND TELEPHONE CONFERENCES TO MEET INDIVIDUAL NEEDS

Sara M. Steele, Ph. D
Department of Continuing and Vocational Education
University of Wisconsin-Madison

Introduction

There are several approaches to Learning Styles--Kolb, Canflield, and others. But do they give enough attention to the rather straightforward question of our preferred sense for taking in information? Who prefers to take in information through their eyes--read? Who prefers to take in information through their ears--hear?

This paper touches upon three somewhat separate but related topics--audio tapes, telephone conferences, and individual needs as I share my experience in combining the three this past year. However, the story of how I came to try this method may be as interesting as the results of my first experience. Here is a brief background.

- I prefer to learn through reading. I feel my eyes and brain function together faster than my ears and brain. Rather than using class time in the course I teach on program evaluation for lectures, I prepare the lectures as printed class notes and use class time for group activities. Even though I am very aware of individual differences in learning preferences, I had not thought about differences in terms of first intake of conceptual material.

- About two years ago, I sat next to a young Doctor on a flight across country. He was a specialist in a demanding field of medicine and impressed me as a very intelligent person. He commented that he learned best by listening. He felt that the human voice gives emphasis to words that it is difficult to duplicate in print. He subscribed to various audio abstract services. He started me thinking about the use of audio with students.

- I decided to read the information from the Evaluation Class notes into a tape recorder and make copies of the tapes. The tapes were about 95% what was in the notes. I only added a little extra material. Chapters in the class notes ranged from 9 to 38 pages and tapes usually ranged from 30 minutes to 1 hour and 30 minutes (two tapes). I found it was easy it is to use the tape reproduction equipment in our Instructional Materials Center. We made 10 copies of each tape.

  I loaned the copies to the students. In each of the two classes, about half of the class checked out the tapes. The students who took a tape each week were most likely to be: a) commuters who listened to the tape as they traveled to classes or b) international students who were working on their English. Some used a tape every week. Others used tapes at the beginning of the semester but stopped about half way. They may have stopped because they did not have time to listen to the tapes, or they may have become sufficiently accustomed to my voice that they could "hear" me talking as they read the material. Those students who used the tapes were very appreciative of the opportunity. One or two commented that they liked to combine listening to the tape and reading the material.

  Some had hoped that I would use the tape to expand upon the print material with more examples, and when they found out that that was not the case, stopped using tapes.

- I've also offered students the opportunity to hand in their assignment either in print form or on a tape. One or two have used the tape option each year. I've recorded my reactions on the back of their tape.

- **I concluded that making course material available to graduate students in both print and audio form is well worth my the time.** A sufficient number of students found it useful. This coming year, I am thinking of doing some supplementary tapes which would go into more depth in areas which interest me or areas where students have wanted more information. Evaluation now includes a wide range of activities from the measurement of results to the negotiation of stakeholder's view of value. Methodology differs greatly according to purpose. As a result the course is an overview without depth related to data collection and analysis.

But now let's go on to the experiment which is the focus of this paper.

An Experiment in Making Tapes Available As Independent In-Service Study

Part of my appointment is with the Cooperative Extension Service. Our county faculty only have four days available for out-of-county in-service at state expense. There are many ways in which they can invest those days. Most need analysis surveys show that a few Extension agents feel a need to learn more about evaluation, but the topic seldom comes up within the top priority areas statewide. I've been reluctant to offer in-service days on evaluation because relatively few agents are likely to enroll.

This past year, when the call for proposals for in-service programs reached my desk, I decided to see how Extension Agents responded to graduate course audio tapes. I indicated that I would be available by telephone to discuss the topics. I tried to make it clear that the tapes were conceptual and would not provide specific directions on how to do evaluation. Those enrolling were expected to listen to at least five of the tapes.

The Enrollees

Thirteen Extension faculty members enrolled, eight women and three men. All four Extension program areas were represented, ranging from two Agricultural Agents to six Extension Home Economists. Four of the enrollees were agents I had worked with sufficiently in the past that we knew each other fairly well. These four were very experienced agents. I had worked with two or three others slightly. This was my first contact with some of the participants.

Process

Enrollees were sent an order form and asked to check as many as five tapes indicating the date they expected to use each tape. They also could indicate if they would like an exercise to accompany the tape. They were asked indicate how many times they would like to talk with me by telephone and what dates and times would be most convenient.

Let me emphasize that last point. As they entered the program they had to make a commitment in their own schedule for finding time to listen to the tapes. Some chose to listen to a tape every two weeks and were through with the program by Christmas. Others chose to listen to one each month. Two did not want to start listening to tapes until April. Those who put it off had the most difficulty completing.

When their forms came back, I set up a list of mailing dates by months in my computer. Each week I checked to see who needed which tapes, located and checked the tapes, developed the exercises, and turned the material over to our secretary to mail. (If the numbers on the enrollment list had matched the numbers on the tape, the secretary could have found the tapes and checked they were rewound and ready to go.)

The Telephone Conferences

Some participants did not opt to talk with me by telephone. One made a point of coming to the office for the first conference and then talking with me after each tape by telephone. Others chose two or three telephone conferences.

The responsibility for what we talked about was left with the agent. (I did not use the telephone conference as a test of their recall or understanding.) The discussions were low key and informal and ranged from fifteen minutes to an hour and fifteen minutes. My department absorbed the cost of the telephone conferences. The total out-of-budget costs probably were not more than the cost for mileage and meals for me to have presented a group session.

During the telephone conferences, some chose to react to ideas included in the tapes. Listening to their comments helped me see how conceptual material and reality meet in people's minds. Some raised questions about parts they didn't understand. Often they dispensed with the tapes and told me about an evaluative activity they were planning. Sometimes they asked for advice related to that activity. In most cases they were confident enough in what they were doing that they would not have made a special effort to contact me, so the discussions gave me access to more of what was going on than I would have had.

Most, during the final telephone conference, took time to say how much they had appreciated the tapes and discussions. I had expected to have written reactions back from participants by this time, but two haven't finished their tapes yet. Scattered over the year as they were, and set at a time convenient both for me and for the enrollee, the 37 telephone conferences were not an undue burden.

What I've Learned

This year was a low-cost experiment. I've learned several things from it.

1. Even though the main information acquisition method was audio, it would be well to also include a print outline and handout of key points. Some of the enrollees had expected to listen to the tapes while driving or working around the house. They found that they wanted to make notes of the ideas and thus had to change their plans.

   I had thought of the tapes as conceptual and "supplementary", something to be listened to, but not something to be mastered. I had expected that most would listen to the tapes while they were doing something physical--driving, washing dishes, etc. Thus I had not prepared for the possibility that the agents would want to take notes.

2. Permitting participants to set their own schedule over a several month period seemed to work very well. Each person has different peak work times.

3. Although the individuals missed the value of discussion with a group of their peers, they had much more opportunity to deal with the questions which were of particular interest to them than they would have had in a group in-service program. One of the last agents I talked with, suggested the possibility of designing audio tapes which could be used by groups. Tapes designed and directed toward getting discussion by the group. Or, when two or three people in different parts of the state are using the same tape at about the same time, group telephone conferences might be arranged.

   One of my current challenges related to distance education is trying to devise ways in which active experiencing can be built into non-face-to- face materials. Discussion is one kind of experiencing. Students see how other people are interpreting, integrating, and creatively using new information.

4. The tapes seemed especially useful with very sharp and experienced agents. They could go farther into the areas that interested them. Often group inservices are limited to entry level material. Although the tapes were more geared to broadening and supplementing the experienced person's ideas, the telephone conferences seemed to also work well with beginners who wanted assistance in working through some of their ideas about evaluation.

5. Asking for a tentative schedule at the beginning meant that agents were more likely to preserve the time in their very busy schedules. Occasionally either the agent or I would have to change the time of an appointment, but establishing a commitment to a tentative date was useful in helping them get to the tapes. Busy people find time to study constantly being squeezed out of their schedules. I offered another independent study where enrollees received a notebook of material at the beginning of the course and were to contact me if they wanted to discuss any of the items. I did not hear from anyone. When I checked several months later, several told me that the notebook was right beside them but they hadn't found time to use it yet.

6. Hearing the resource person's voice personalizes a learning activity more than print material. It may be well to send an orientation audio along with print independent materials. A well done orientation tape can offer more stimulation than does similar information in print form.

7. In my most recent telephone conference, the agent asked about keeping the tape. She wanted to share it with other agents and discuss parts of it with them. This was a new idea for me. It could be done with out selling, if the person who wanted to keep a tape simply were asked to send a blank tape to replace the tape they were keeping.

Although I see a lot of positives in the use of audio tapes, there also are some negatives which have to be overcome.

- It takes time to listen to a tape. Fewer words pass through our ears per minute than pass through our eyes. People who are used to reading, know that they can cover the same material faster reading. They also know that they can make their notes by marking the text rather than having to write.

- It is hard to keep one's mind on what a bodiless voice is saying. There are too many visual distractions. Most speakers can't keep up to the quickness with which our brains can process material and we are likely to drift off. Tapes have to be designed both to clearly present. information and to keep attention.

Those two barriers really are not much different from those faced in group situations where the lecturer uses no visual reinforcement and is colorless. Both can be partially overcome through the design of the tapes and supporting print material.

Probably the most difficult barrier to overcome is that of helping the student to work study into a busy schedule. Going to a group session has the automatic time demand of a certain number of hours at a certain time. Independent distance learning packages do not have that built in factor. In some instances, being firm about a return date for a tape may help. Cautions, warnings, and ideas, for how to control schedule may help. Also designing tapes so that they can be listened to without taking notes, with the assurance that the main notes are in print form, may make it easier to fit in time to listen.

My Conclusions

I was sufficiently pleased with the results of the experiment that I am offering additional in-service programs via this means this coming year. The new offerings will include tapes and print material developed specifically for Extension agents focused on a specific topic.

I will take more time in developing the tapes. Audiotapes offer great possibilities for capturing discussions, interviews, problem analysis, role play, sound effects, and the other sounds which add depth and interest to information. (I have had the opportunity of hearing some of the taped courses WHA prepared with funding from Annenberg, so I know what a good tape can sound like even though I did not use any of the devices this past year.)

This coming year I will script the text for audio rather than reading text prepared for print form. For example, I prepared a print publication on choosing the form of question for various purposes. I will do an orientation audiotape to introduce the bulletin and then will help enrollees via telephone and mail as they use the information in developing an instrument.

I will continue to offer coaching, mentoring, and/or Devil's advocate scrutiny via telephone to those who wish it. Their having used the tape-print kit first will mean that we can get the discussion to the heart of the matter faster without having to digress and provide necessary background information.

Expanding Ideas

I started these experiments simply to serve those who preferred to take in information through their ears. But the results have started me thinking about kits of audiotapes and print notes followed by telephone conferences as being excellent, low cost ways of meeting individual needs. Special needs may occur as follows.

- **Advanced and especially capable people who are ready to go more deeply into a subject than the average person.** The resource person can pull together new content in the area, and, with some thought and organization of that material, can prepare a tape and accompanying print notes with less work and cost than developing a print piece. If tape and outline can guide later development in full print form if others need the information.

- **Remedial materials for the person who is having a good deal more difficulty than the rest of his or her colleagues.** Sometimes having a tape which explains things is very helpful.

- **People who lack confidence in their ability to handle a subject.** "Pep talks," and oral hand holding can be built into a tape through the warm and informality of the speaker.

- **Topics where one needs the dynamism provided through hearing oral interaction.** Reading a scripted play is far different from hearing actors carry out the roles.

- **The person who has to miss an in-service because of illness or a family crisis.** Tapes help the person catch up.

- **And of course, tapes help the person with vision problems.** But they apparently also are very important to people who want the emphasis given by the human voice.

Audiotapes may be formal, carefully scripted and designed, or they may be an informal chat with the other person. Either way, they can bring color, accent, and warmth which it is very difficult to build into print material.

Audiotapes may be especially attractive to the person who is used to listening to the radio. They may also be especially useful when one is trying to expand consciousness or help people understand and assess their attitudes. Such tapes are undemanding and permit one to do hand work and other non-thinking activities as they listen. If tapes are used to convey "heavy" factual material, more attention must be given both to how the tapes are promoted and the kind of support and orientation that is given.

I can't speak for others, but I've decided that I've let the easily devised technique of audiotapes be overshadowed by their more expensive, time consuming cousins, videotapes and computer software.

Training the Trainer: "Interactive Television Instructor Workshop"

Barbara Cummings
Associate Dean of Alternative Delivery Systems
Robert Sween
Supervisory Management ITV Instructor
Northcentral Technical College at Wausau, Wisconsin

The use of Instructional Televised Fixed Service (ITFS) to deliver educational programming and instruction in the state of Wisconsin is in its infancy. Several Vocational Technical and Adult Education (VTAE) colleges have or will become studio to transmitter links for the ITFS system that is being constructed throughout the state by the Education Communications Board (ECB). In addition, several colleges are constructing their own microwave telecommunication systems which will be used as a delivery system for adult education instruction. With this new technology comes the challenge of orientating and training of the users on how to most effectively and efficiently utilize the ITFS/microwave system.

The Wisconsin VTAE system has a Media Consortium which meets regularly with representation from each of the 16 colleges. This consortium deals with the implementation of distance learning technologies as satellite delivered programs, video based courses, correspondence courses, interactive computer courses, and interactive television (ITV) systems. Part of the implementation process for each of these delivery systems is providing a network for inservicing and educating the VTAE faculty and staff on the technology and how they can be used to meet the educational needs of their college. As over eight of the districts are in the process of constructing an ITV system to deliver their services, the Media Consortium submitted a professional development project for state VEA funds to conduct training workshops for their faculty on "how to teach using the ITFS/microwave technology".

The project was funded for the 1989-90 academic year for 3 separate two and one half day (20 hours) workshops for the VTAE faculty, administrators, and staff. A committee consisting of a national ITFS consultant, state media consultant, an experienced faculty that had used ITV to deliver instruction, an inexperienced faculty that would be using ITV, an instructional manager of an ITV system, a media manager of an ITV system, and a training specialist, designed, promoted, implemented, and evaluated the ITV training workshops. The workshop were conducted in August, January, and May during semester breaks for the colleges.

The workshop was designed to provide the participants with "a hands-on" experience of using an ITV teaching station/classroom and an opportunity to work with coaches/mentors that had experience teaching via ITV. The workshop also addressed the credibility of using this medium as an effective way to deliver instruction. Other components that the workshop addressed was the philosophy of distance education, a primer on telecommunication systems, the adult learner, support systems for ITV, curriculum design, and teaching techniques and strategies.

The workshop was conducted at Northcentral Technical College which was able to provide four teaching stations/classrooms and the support staff for the

experiential components. The entire workshop was conducted in an ITV classroom in which the presenters used the cameras and teaching station simulating an ITV class. The participants were instructed to use the push to talk microphone when interacting along with identifying who they were and from which location they were attending the "class". All portions of the workshop were video taped for the participant to take with them as a resource.

The committee worked with University of Wisconsin- Stout in accepting the workshop as a course for which they granted one undergraduate or graduate credit. The participants had the choice of enrolling in the workshop for credit which could also be applied towards their VTAE continuing education certification.

The workshop was designed to provide a model of excellence in the utilization of a variety of teaching techniques. Visuals used included graphics prepared for the overhead camera, slides, video tape, and actual objects. Presenters used lecture, discussion, panel presentation, buzz sessions, participant presentation, demonstration, team teaching, role playing, and worksheets. The participants were provided a three ring binder for all the print materials that accompanied each presentation.

Each participant was given two opportunities to give a "lesson" using the ITV teaching station. They were divided into four teams/groups of five to seven members with a experienced ITV instructor "coach/mentor" as amember of their team. Their first presentation was a 3-5 minute slice of their life which was intended to create a "comfort zone" for the medium. Their second lesson was assigned prior to their coming to the workshop. They were asked to bring along visuals and other instructional materials that they would like to experiment with using the ITV system. The graphic department was available for their
use along with duplication and library resources.

During their presentations they each played a role either as a teacher, a classroom student, a distance student in another (distance) classroom that was set up as a receive site, and a peer evaluator. Each of their presentations were video taped for their use in self evaluation. Each coach used a simple evaluation form that gave the participants immediate feedback on their presentation. They first allowed the participant to share their personal feelings about the experience, secondly they focused on what they did well, and thirdly, on what may work better for them.

Prior to their experiential learning, the workshop agenda was designed to give the participant the necessary information they needed to make their teaching experience a positive one.

DAY ONE:

1) Introduction to Distance Learning focused on the concept and identifying the need for using the ITV technology as a delivery system for instruction. The presenter, Dave Bunting, has had over 10 years of experience in coordinating and managing an ITV system at the Kirkwood Community College in Cedar Rapids, Iowa. This session also used an instrument

to measure the participants knowledge about distance education and the adult learner.

2) Instructional Issues and Concerns in using ITV as a delivery system. This portion addressed the challenges/barriers that faculty have identified in using ITV as a delivery system. The participants were divided into groups and choose three issues to discuss from a prepared list. After twenty minutes of discussion, the groups reported back on how these issues needed to be resolved.

3) A Technology Primer introduced the various telecommunications used in education and that are presently being used in the the state of Wisconsin. It gave a very brief description on how ITV works but focused more on the design of the ITV classroom and the teaching station, and the technical support.

4) Introduction to the ITV Teaching Station (Horsin' Around) session gave the participant the opportunity to go to their ITV classroom and examine the mechanics of pushing the buttons and operating the cameras and microphone. (After the first workshop this was moved to the first day because of comments we received from the participants in the evaluation.)

5) ITV Student and Facilitator Forum demonstrated how an ITV system worked at Northcentral Technical College. From each of NTC's regional campuses, an ITV facilitator and 2 ITV students were part of a panel presentation for the participants to ask their questions. Robert Sween, one of NTC's ITV instructors, moderated this session. The students and facilitators shared their experience in the ITV classroom and what they expected from the instructor.

DAY TWO:

6) Support Systems for the ITV Classroom was presented by Dave Bunting, Dean of Instruction Services at Kirkwood Community College, and Barb Cummings, Associate Dean of Alternative Learning Systems at Northcentral Technical College. They presented how each of their colleges provide their ITV instructors and students with a "team" of support services from facsimile equipment to administrative support, courier services to test proctors.

7) How to Teach via ITV was presented by Robert Sween, an NTC ITV instructor.
Robert shared his experiences as an ITV instructor emphasizing the importance of organization, flexibility, bridging the distance, bonding of the class, humanizing the technology, handling of instructional materials, and interacting with the students. Also as part of his presentation, Eileen Flynn, a graphic artist, explained the rules for making visuals for television and the support her department provides for the ITV system.

8) Instructional Design for ITV was facilitated by Dave Bunting and involved the ITV coaches in the presentation. This was the final classroom presentation before the participants were given the opportunity to apply what

they have learned. Dave's presentation gave examples of course syllabuses and learning activities for the ITV classroom.

9) Experiential Learning session was the first time the participants use the ITV teaching station in their groups/teams to give a 3-5 minute slice of life which gave them a taste of using this medium. They were then given the guidelines for their formal learning experience for the next day. The rest of the afternoon (about 1 1/2 hours) were made available for them to prepare their presentation.

DAY THREE:

10) ITV Classroom Presentation was the formal 15 minute lesson that each participant presented in their groups/teams with role playing and feedback from their peers and coaches.

11) Debriefing and Evaluation brought the participants back together to discuss their experiences and how they planned on using what they had learned. We also used this time to complete a formal evaluation form and to get their input on how the workshop could be designed to better meet their needs.

On day three, we also offered an administrators workshop on Designing, Supporting, and Implementing a Distance Education System. Dave Bunting presented this workshop with emphasis on the college's commitment to philosophically, financially.,and instructional supporting their ITV system. He also addressed the issues and concerns that faculty have regarding the use of ITV as an educational delivery system.

The workshop concluded with lunch for both participants and administrators. After lunch, the participants shared their experiences with their administrators and identified the challenges that needed to be addressed in implementing their ITV systems.

Overall, this workshop was a success and was evaluated by 93% (68) of the participants as excellent and they would recommend it to their peers. The VTAE Media consortium will be submitting a proposal to continue offering this workshop as more of the colleges are beginning to use ITFS/ITV as a means for delivering their instruction. The participants felt it was desirable to offer this workshop state-wide rather than an in-house workshop, as they were able to network with other advocates of distance education which gave them a more "global" look at teaching using new technologies.

Creative Problem Solving for Innovative Distance Learning Programming

Martha H. Salmon
The College Board
Southwest Regional Office
Lise Patton
Arts and Sciences Teleconferencing Service
Oklahoma State University

Preface

In September of 1989 the College Board and the Arts and Sciences Teleconferencing Service (ASTS) at Oklahoma State University co-sponsored *PSAT/NMSQT Preparation By Satellite*. This was a seven broadcast program delivered via satellite to 272 schools in 37 states. The program was created to assist students in preparing to take the Preliminary Scholastic Aptitude Test/National Merit Scholarship Qualifying Test (PSAT/NMSQT). This test is taken by students in their junior and sometimes sophomore years. It is the first college entrance exam most students will take regardless of whether they will later take the ACT or the SAT. While there are a lot of test preparation programs students can use, the *PSAT/NMSQT Preparation By Satellite* program was unique in that it is the only program co-sponsored by The College Board, owners of the PSAT/NMSQT and the SAT. Some of the presenters for the program came from Educational Testing Services (ETS) the creators of the PSAT/NMSQT and SAT. This gave students the opportunity to interact directly with the people who are responsible for the creation and administration of the test.

The College Board is a nonprofit, membership organization that provides tests and other educational services for students, schools, and colleges. The membership is composed of more than 2,700 colleges, school systems, and educational associations. Representatives of the members serve on the Board of Trustees and advisory councils and committees that consider the programs of the College Board and participate in the determination of its policies and activities.

Founded in 1985 the Arts and Sciences Teleconferencing Service (ASTS) at Oklahoma State University currently provides ten satellite-delivered courses to high schools across the country. In 1989-90 ASTS provided the following courses to 375 schools in 27 states: German I & II, Russian I, AP Physics, AP Calculus, AP Chemistry, AP American Government, Trigonometry/Analytic Geometry and Basic English and Reading (grades 7-8). All courses are taught by Oklahoma State University faculty members and use a live interactive format. A partnership developed between ASTS and The College Board in 1986 when ASTS began to offer Advanced Placement courses via satellite. Currently four of the ASTS courses are Advanced Placement courses.

Introduction

> In the years immediately ahead, the traditional age group of college applicants will decrease in number, the proportion of this age group that is described as traditionally disadvantaged will continue to grow and include more black, Hispanic, and immigrant children. Unless students are prepared and encouraged to enter higher education, the percentage of college graduates among the adult labor force will decline. Such a decline poses a threat to our standard of living, the development of our communities, and the nation's ability to compete successfully with other countries. The promise of equal educational opportunity has been made, but not kept. Better counseling and guidance services in schools constitute an important element in making that promise a reality for all students.
>
> -- *Keeping The Options Open*, College Entrance Examination Board, New York, September 1987.

PSAT/NMSQT Preparation By Satellite was created to provide assistance to students in traditionally underserved areas prepare to take that important first step towards college. This project was able to draw upon an established relationship between two dynamic institutions committed to serving the traditionally underserved.

especially rural areas. It is the common philosophy of these two institutions that "rural" doesn't have to mean "disadvantaged". Geographic isolation can be overcome by satellite-based technology.

It is certainly not the intention of either ASTS or The College Board to threaten or replace existing programs in rural areas, but rather to complement current programs or provide access to information where it otherwise might not exist.

PSAT/NMSQT Preparation By Satellite Development

The College Board had identified a number of issues they felt particularly affected underserved schools. Foremost on this list was the issue of test preparation. A small planning group from The College Board and ASTS got together to put their ideas into action. Critical to the success of this planning group was their ability to make decisions and translate those decisions into action.

The project began at somewhat of a disadvantage as this planning group first met and conceived of this program with only five weeks left in the school year. The programs were designed, and scheduled, a budget was set, marketing goals were developed, and promotion material was sent out within one week's time.

The resources of The College Board greatly assisted with the selection of the program presenters. The director of academic services from the southwest regional office of The College Board was selected as the program moderator. Test developers from Educational Testing Service were brought in by The College Board to make presentations during the program about the math and verbal sections of the test. This decision would provide students with direct access to the creators of the PSAT/NMSQT.

Program design and scheduling

The PSAT/NMSQT exam is divided into two sections; verbal skills and mathematical skills. The *PSAT/NMSQT Preparation By Satellite* program was divided into three sections; introduction and conclusion, verbal skills, and math skills. Seven 45-minute programs were broadcast each Tuesday and Thursday before the PSAT/NMSQT exam was given in October. The College Board moderator was present for the entire series. His guests included a test developer from Educational Testing Services responsible for items on the verbal sections of the PSAT/NMSQT, a test developer from ETS who works on math sections of the PSAT/NMSQT, and a counselor who works with students taking the PSAT/NMSQT. These three persons were able to contribute their first-hand knowledge of the PSAT/NMSQT and share their experiences with students.

Budget and marketing

The initial budget for the entire program was set at $30,000. The College Board was to be responsible for $15,000 and ASTS for the other $15,000. As new programs always provide surprises, the budget was exceeded in certain unforeseen categories, but overall the initial budget remained intact. The intended market for this program was the schools belonging to the ASTS network. We discovered that this program was very attractive to schools who might not otherwise participate in an ASTS course due to financial, accreditation or time limitations. Therefore ASTS was able to expand into ten new states that had not participated in an ASTS program before.

PSAT/NMSQT Preparation By Satellite Execution

Multiple sites

This program was welcomed by the marketplace with great enthusiasm. The relative ease of the program, being only seven broadcasts long made the program appealing to a number of subscribers. The cost was also a big factor for the program's popularity. ASTS is a member of the Midlands Consortium which received 5.5 million dollars from the U.S. Department of Education in the form of a Star Schools grant. This combined with the resources of The College Board enabled the planning committee to keep the price for this program low. A single school could participate for $150.00, and multiple sites could participate for $175.00. (A multiple site was defined as

a group of two or more receiving sites working together.) This multiple site pricing provided plenty of opportunities for creative interpretation of the definition of a "multiple site". Entire states could qualify as a "multiple site" under our definition. PBS affiliates could subscribe to the program, distribute it to their area schools and surrounding communities and still qualify as a single "multiple site." In fact, other satellite-based networks/vendors could subscribe to the program and distribute to their members as a single multiple site. The planning group clung to its original plan of $175.00 for a multiple site and added a subsite fee of $30.00 to cover the cost of the written support materials and shipping. During the development of the second year of programming careful consideration was given to the definition and pricing of multiple sites.

Live vs. Tape

The next issue that surfaced was schools watching the program live or on a tape-delay basis. Many schools found that for technical or scheduling reasons they were forced to watch a tape of the broadcast. In order to accommodate the questions from participants who were watching on a delayed basis, we decided to extend our 1-800 phone lines beyond the programs' broadcast schedule. The question was how long and on what days should the phone lines be open. We surveyed the participants and found the only possible solution to solve everyone's needs was to open the lines 9:00am-5:00pm Monday through Friday for the duration of the program.

The planning staff found itself in a position to modify the original program administration plan in order to meet the needs of the audience. This flexibility was critical to the overall success of the program and the goodwill it generated among the participants.

Materials

The next hurdle to overcome was the written support materials that accompanied the broadcasts. These materials were additional problems, homework activities and materials for reading comprehension problems that were too extensive to cover on the air. It was critical to the program's success that the participants have the materials before, during and after they viewed a program. In order to avoid the cost of printing a set of materials for each participant, these materials were set up for duplication, making the schools responsible for duplication and distribution these materials to their viewers. In most cases this idea worked well. In the case of very large schools the effort and cost of the duplicating became a burden, and in the case of the economically disadvantaged school any additional outlay was almost too much for them. It was brought out in the evaluation of the program that participants who did not have the written course materials were at quite a disadvantage during the programs.

Other satellite networks/vendors

The ease and low cost of this program made it very attractive to the other satellite networks/vendors. It has been the intention of ASTS and some of the other satellite networks/vendors to share programming for quite some time. We were able to reach an agreement with the STEP program from Washington state to make this program available to STEP viewers. Agreement with other satellite networks/vendors, such as the South Carolina based SERC, have been negotiated for the 1990-91 series.

Balancing cost vs. service philosophy

The overriding factor in every decision that was made on this project was the cost. Balancing the budget while providing the best possible service to the program participants became a major source of concern. It was our position that, if at all possible, the participant's needs should be provided for in every aspect. This philosophy demanded that our budget have an adequate contingency fund.

PSAT/NMSQT Preparation By Satellite Evaluation

Problems Identified

This program was evaluated by the multiple site coordinators, site facilitators and the students participating in the program. Three areas came out in the evaluation as areas of concern. They were the program timing, the written support materials, and content suggestions.

The timing of this program can be broken into two areas: the lead time involved in setting up the programs and the amount of time between the programs and the actual test. Sites participating in the program had very little time between the release of the promotional material and their summer break and the end of the summer break and the beginning of the program. This short planning time caused a large number of the sites to subscribe to the program after they returned from their summer break. This was not the best situation for the sites as teachers had little time to prepare for the program in addition to their other beginning-of-school duties. Teachers also felt that that as this program ended two days before the first testing date, this didn't provide them with enough time for review.

Some sites felt the written course materials were too extensive to make copies for each student participating in the program. This problem was limited to the very large schools and the economically disadvantaged schools. The very large schools found themselves duplicating hundreds of pages of material, and the economically disadvantaged schools found that any additional outlay was almost too much for them.

And finally, a number of the sites made helpful suggestions about ways we could improve the program's content (pacing, quantity of problems covered, etc.), in addition to suggestions for other programs.

Response to Problems Identified

Due to the success of this pilot program we have developed the *Precollege Guidance Information Series*, which is a total of thirteen hours of programming dealing with test preparation, college selection, college financing and early awareness of college as an option. We were very sensitive to the comments made during the evaluation of the *PSAT/NMSQT Preparation By Satellite* program in developing this new series.

The timing of the new series was greatly improved as we began our planning process in the fall of 1989 for the series for the 1990-91 school year. While this is not the very best situation, it is a great improvement over the way we handled the original *PSAT/NMSQT Preparation By Satellite* program. The promotional material was available in early February of 1990 for the new series beginning in September of 1990. Our goal is to make the promotional material for the 1991-92 series available one year in advance. In order to provide the receiving sites more time to work with the *PSAT/NMSQT Preparation By Satellite* program, we shortened the number of programs and moved the broadcast schedule up so the last broadcast finishes eight school days before the first testing date.

The written support materials for the *Precollege Guidance Information Series* have been condensed as much as possible to limit the number of pages the sites will be responsible for duplicating. More questions have been added and the size of the problems have been reduced to provide more questions per page. Our goal is to eventually be able to provide the participating student with prepared course materials.

The content for the new series has been developed based on suggestions from our participants and research done by The College Board. Based on feedback we have received about the new series, we feel we have been successful in identifying areas which are of concern for schools across the country. It is our intent to pursue outside funding for this program in order to provide this much needed service to schools at a nominal charge.

In developing innovative programming we all must bear the responsibility of providing quality models on which to base future ideas. Our goal is to continue to identify areas where satellite-based programs can be of assistance to the traditionally underserved schools.

INSTRUCTIONAL DESIGN FOR MULTILINGUAL NATIONAL TELECONFERENCING

J. Murray Richmond, M.Ed.
C. Douglas Chaudron, M.Ed.
Ken Radway, M.Ed.
School for Addiction Studies
Addiction Research Foundation of Ontario, Toronto, Ontario, Canada
Judy Roberts, M.A.
Director, Northeast Regional Co-ordinating Centre
Contact North/Contact Nord, Sudbury, Ontario, Canada

Introduction

A three-part national workshop was conducted, in English and French using simultaneous translation, on the topic: "Cocaine: Dealing with its Challenges." Twenty-eight sites, one or more located in each of the ten provinces and both northern territories, were linked with the program studio at the Addiction Research Foundation (ARF) in Toronto, Ontario, Canada. The project was the first teleconference workshop delivered through the National Training Exchange, a collaborative program of the provincial addictions agencies and Health and Welfare Canada. The workshop was developed by the ARF under a service contract with Health and Welfare, Canada.

The Project Team

The cocaine workshop was developed using a project team approach. The five members of the core team were chosen on the basis of their complementary skills and experience in addictions education, instructional design, teleconferencing and distance education. Two members of the team were fluently bilingual.

The core teleconferencing team was responsible for project planning, site coordinator training, the cocaine workshop design, development and delivery and project evaluation. Seven different subject matter experts provided the main content for the workshop sessions. Three were ARF scientists and the other four consisted of a medical doctor, a psychologist, a pharmacologist and a law professor.

The Organization of the Workshop

The project team organized the main topic, Cocaine, into 5 sub-topics and identified subject matter experts to present key content for each workshop session. Workshop sessions were presented in short segments and participants were given frequent opportunities to interact with the content experts. There was a 5-minute break at the mid-point of each program. Activities for participants were scheduled for up to 30 minutes before and after each teleconference. Coordinators' and Students' "Guides" were produced and distributed prior to each program.

All sessions were conducted in English and French using simultaneous translation. Translators were provided by the Interpretation Services of the Secretary of State of Canada. Twenty-four sites were English and four were French-speaking.

The provincial addictions agencies were responsible for publicizing the workshops, selecting their sites and assigning site coordinators. The resulting network spanned the country from coast to coast and north to south.

Instructional Design Challenges for Multilingual Teleconferencing

The main instructional design challenge was providing an equivalent training experience for both English and French sites by using simultaneous translation. Two additional challenges were training the site coordinators at a distance and integrating the subject matter experts into the teleconferencing process. The approach taken to addressing each of these areas is outlined in the following sections.

1. Instructional Design for Simultaneous Translation

The basic instructional design requirement for the workshop was that a person at any site should be able to ask a question in her/his own language. To accomplish this straightforward-sounding requirement required using a bilingual moderator and developing a switching protocol for the bridge operator.

During presentation segments of the workshop, the English and French sites were configured into two separate teleconferences. For interactive segments, however, occasional joining-separating of the English and French teleconferences was required.

After some experimenting, it was determined that the best way to begin each workshop was with the English and French sites separated. Six of the seven experts were English-speaking so that the usual situation was to have the English sites receiving the original presentation, while the French sites received a translated version. At the end of a presentation, the moderator would intervene and request questions specifying whether they should come from English or French sites. In the case of an English-speaking presenter receiving a question from an English site, the conferences remained separated. However, for the same presenter to receive a question from a French site it was necessary for the moderator to request that the bridge operator combine the conferences. Following a brief pause, the moderator would then accept the question in French and translate it for the benefit of the presenter and the English sites. Then the conferences would once again be separated and the presenter would reply in English while the French-speaking person who asked the question would receive only the translated answer. Because the conferences were then separated, there was no possibility to intervene further and ask for additional clarification or make a comment to the reply. This latter condition created what proved to be an important source of dissatisfaction with the translation process. In a typical interactive session, there would only be one or two cycles of joining-separating the conferences.

The use of simultaneous translation required a number of adaptations to the usual teleconferencing situation. Among the requirements were specialized equipment (which is usually housed in a self-contained, tent-like booth), enough physical separation between presenters and translators so that audio does not "bleed" from one sound track to the other, and the use of two translators who switch on and off primarily on the basis of time,

rather than who is speaking (i.e. the usual situation is that there is no change in the translator speaking even when participants ask questions and the presenter replies). As well, the translators want to be able to see the person speaking and, if possible, have a complete script of any presentation.

The requirements of the translators imposed some constraints on the conventional instructional design for teleconferencing. For example, while it was possible to provide a variety of voices and to always identify speakers by names during English-English or French-French interactions, the translated version lost the fidelity of the process. Only one voice was heard, names were dropped, and the natural cadence of the question-answer duet was washed out.

2. Training the Site Coordinators at a Distance

Site coordinators were selected by the cooperating addictions agencies. Most had no previous experience with either teleconferencing or simultaneous translation.

Two training sessions were conducted by teleconference. The first, held separately for English and French coordinators, was designed to provide a hands-on experience with the teleconferencing equipment in the actual location of the workshop. Coordinators were provided with an agenda, an overview of the project and a checklist of tasks, room setup suggestions and troubleshooting procedures. During this training session, each coordinator was called upon to participate at least twice. The second training session combined the English and French sites into a single teleconference and focused on developing the protocol for simultaneous translation.

Before each workshop, site coordinators were provided with an agenda which indicated their specific tasks as well as the detailed program for that session. Typical duties included duplicating and distributing program materials, conducting pre-teleconference "warm-up activities and post-teleconference evaluations and facilitating participation at their sites.

3. Orienting the Subject Matter Experts to the Teleconference

Because of the one-time nature of their participation, no formal teleconference training was provided for the subject matter experts. Instead, each expert was paired with a member of the core team whose task was to orient the presenter to her/his role in the workshop and work out an individual outline for the presentation. The format recommended was an initial interview followed by a short lecturette (10-15 minutes) which was, in turn, followed by an interactive question and answer segment. Usually, two cycles of this sequence were accomplished in the 40 to 55 minutes allotted to each expert. Six of the seven experts used this format. The pharmacologist, because of the nature of her subject matter, conducted a 35 minute lecture, illustrated by 12 transparencies, and followed by a single question and answer period (and received one of the highest ratings of any workshop segment).

Five of the experts participated in the workshop from the Toronto studio location and were in direct contact with their core team member. Two others took part in the conference from their offices, one from London, Ontario and the other from San Francisco, California. The French-language expert was flown to Toronto from Montreal to present. To conduct his portion of the workshop from Montreal would have required a second team of translators and equipment at the Montreal site. This was judged unfeasible given the complexities introduced by the translation process.

Evaluation of the Cocaine Workshop Sessions

Participants were asked to fill out a "Cocaine Workshop Evaluation" at the end of each session. A "Teleconferencing Questionnaire" was administered at the final workshop to measure participants' overall impressions of their teleconferencing experience.

Participants at the English sites rated the overall cocaine workshop experience very highly and more favorably than those at the French sites. Those aspects of the workshop which received generally satisfactory to high ratings across all sessions included the: content of presentations; format of sessions; usefulness/relevance of content; handouts/visuals; pre-teleconference exercise; audio quality; and, overall teleconference.

Features of the teleconference experience which received less satisfactory ratings across sessions included the: English and French combination/translation; interaction; and, opportunities for questions.

The cocaine workshop was a definite success as far as English-speaking participants were concerned:

- 95% were comfortable with the teleconference process;
- 95% found the teleconferencing equipment easy to use;
- 86% felt that teleconferencing was a good way to present the workshop;
- 90% would attend another teleconference workshop; and,
- 86% rated the overall workshop experience positively.

French-speaking participants had a less positive experience:

- 79% were comfortable with the teleconference process;
- 72% found the teleconferencing equipment easy to use
- 52% felt that teleconferencing was a good way to present the workshop;
- 64% would attend another teleconference workshop; and,
- 75% rated the overall workshop experience positively.

French-speaking participants found the translation to be a constant problem. Many indicated that they would have liked more French-speaking presenters and more opportunities to interact with presenters without the need for translation. The need for more French supporting materials was also emphasized.

The translation process was the major source of dissatisfaction with the workshop sessions for both French and English participants. 35 % of the French and 19 % of the English respondents to the "Teleconferencing Questionnaire" indicated that the English-French switching/translation was the one thing that they liked least about the teleconference workshop. However, because only one presentation was in French, the negative impact on French-speaking participants was qualitatively greater.

Conclusions

In this project, the program team adapted standard teleconferencing design concepts to the requirements imposed by the conventions of accepted practice in simultaneous translation. The result was that two different workshop experiences, one highly successful and the other markedly less so, were produced. In order to provide a more uniform experience in both languages, it seems apparent that the translation process needs to be adapted to the special requirements of teleconferencing.

Two factors which interacted to create the problem were the lack of prepared scripts for presentations and the conventions of the "standard" translation approach. The absence of prepared scripts resulted in an uneven delivery in which relatively long pauses alternated with periods of rapid speech. Standard translation protocol, which was developed for face-to-face situations where the participant can see the speaker, provides an unemotional delivery style with translators switching after a fixed time period. A more flexible approach is required for teleconference presentations where visual cues and "body language" are absent and the voice is the primary vehicle of communication.

The alternative of conducting separate teleconferences for English and French sites, while logistically appealing, can actually introduce greater variance and inequality into a training workshop by limiting access to experts of only one language.

The following recommendations for improving the translation process, as applied to teleconference training, are based on discussions with the translators, observations and suggestions from participants:

1. Use scripted or pre-recorded presentations as a basis for the translation and only go to "live" translation for the interactive portions of programs.
2. Provide orientation/training for the translators to familiarize them with the special requirements/limitations of the teleconference format.
3. Use more translators and pair them with same-sex presenters to provide greater variety of voices and more "natural" presentations; and,
4. Provide translators with an orientation to the training topic(s) by a bilingual person from the addictions field who is familiar with addictions and medical terms in both languages and, also, provide them with a written list of the specialized addictions and related medical terms which will be used in the training sessions.

With these adaptations, it should be possible to provide a more uniform teleconference experience when using simultaneous translation.

Strategies For Assessing and Supporting Distance Education Courses

Prof. Cliff Bilyea
Director of Part-Time Studies/
President Telecollege Production Inc.
Wilfrid Laurier University
Waterloo, Ontario Canada

BACKGROUND ON TELECOLLEGE

Laurier is one of sixteen provincially supported institutions in the province. The University has been offering courses to part-time students for 30 years and distance education (televideo) courses for 11 years.

In 1990, 42.3% of the student undergraduate body are part-time students of which 20.8% are distance students. In total 8,519 courses credits were offered in 1989. Currently the university offers 35 distance education courses including a degree at a distance in Sociology.

OBJECTIVES OF THE PRESENTATION

The presentation will briefly discuss strategies involved in precourse selection, course design and update and replacement of current courses. However the major emphasis will be on the assessment and support of the current offerings from the perspective of the distance learner, the faculty and the institution. Therefore the objectives will emphasize those later issues.

Objectives

1. to develop a long term plan (5 years) for course section, development and updating

2. to develop a variety of courses which address the needs and are relevant to the cross section of distance education learners.

3. to understand the reasons why students select distance education

4. to identify and successfully use the various internal and external sources of information on distance education

5. to develop and implement support strategies that empower the students and assist the faculty in offering a quality distance education program.

6. to improve retention rate in distance education courses.

COURSE SELECTION, DEVELOPMENT AND UPDATING

Not unexpected we have found a direct co-relation between successful classroom course subjects and distance education course. The one exception are courses which ideally lend themselves to our video format approach such as Astronomy and Anthropology which are more popular as televideo distance courses.

With few exceptions we have made a conscious decision to offer televideo distance courses and thereby the range of courses available for purchase is significantly smaller than print based correspondence programs.

Every course is approved by an Academic Advisory Committee which oversees the selection of texts, preparation of resource materials and evaluate the appropriateness of assignments, tests, and examinations. A five year schedule of current courses and future proposed courses is maintained and updated with input from the appropriate Academic Dean.

DATA SOURCES

Internal university data comes from distance education student course evaluation, annual student surveys, an annual faculty assessment workshop and information gathered from department staff. External sources include the use of the KOLB Learning Style Analysis and numerous books and journals on distance education.

STRATEGIES FOR ASSESSING DISTANCE EDUCATION COURSES

Target Market

The profile of the distance education student is often only expressed in terms of sex, age and marital status without looking at who "the real learner" really is. From surveys we have been able to establish 4 distinctly different profiles which we identify as: 1) the failure syndrome individuals, 2) the life style distance learners, 3) fast trackers with sanity and 4) the joy of learning folks.

PRODUCT

The two major groups (2 and 3 under target market) do not simply want courses but rather credentials. Simply offering a few distance courses is almost bound to fail. Next to courses that give or lead to a professional recognition, the most popular program of study is the full degree program. The last area of importance, in terms of our four different distance learner groups, is a good cross-section of first year courses in the Arts-Science area. These courses partially appeal to the fear of failure syndrome individuals who may at a later date if successful attend classroom courses.

Despite the above analysis, the bottom line for success is still the excellent reputation of the quality of a university's program, - fully acceptable to both full and part-time students.

Place

Distance education proves convenience, flexibility and choice. Assessing the method of delivery is important. It is helpful to have two parallel modes of delivery for many reasons.

Broadcasting of video programs over cable and public television allows for a pacing mechanism just like regularly scheduled classes. A personal set of tapes for home viewing is ideal in that it allows the student to review the material several times.

Price

Some students are price sensitive when resource costs for courses are high and will "vote with their feet" for less expensive courses. In our KIT DISTRIBUTION CENTRE we offer an opportunity for students to preview the material and approximately 10% will select a course based on the price. The more important aspect related to price is the opportunity to buy used texts or sell their texts after the course is over.

Promotion

Assessing the best promotion strategy goes back to a clear understanding of your target markets. If professionally designated programs, then the professional societies' mailing lists with a jointly signed letter, is an ideal way to reach this group. Over the past 15 years we have tracked response rates using the following approaches: news releases; cable bill inserts; brochures in libraries, Chambers of Commerce, community information centres, cable companies, and video stores; as well as newspaper, television and radio. The results will be discussed in more detail in the workshop.

STRATEGIES FOR SUPPORTING DISTANCE EDUCATION COURSES

From our assessment we have developed strategies in three distinct areas; students, faculty and institution. Our approach to supporting distance education has been from the viewpoint of what the student expects from the course and the learning experience.

Strategies for Empowering the Student

From our research only 5% of the distance students selected the course because it was not available otherwise. Therefore we must respect their wishes and not turn the distance course into a semi classroom course with a number of required on-campus classes. Our support service strategy is based on the premise of making access to university information easy and beneficial to students, but not requiring them to come on campus.

Some of the support systems that we have in place which improve our retention and the student's enjoyment level of the course are as follows:

* a toll-free line where students can call their faculty;
* a class list by course which is broken down by geographic centre with student names and telephone numbers. This list encourages networking;
* a study skills package which is given to all new students enrolled in a distance education course. In addition one evening a week when students can call for study skill advice;
* evening hours for personal and career counselling;
* students unable to attend the two teleconferences per term can obtain an audio tape of the conference;
* students majoring in Sociology have access to a distance education advisor in that discipline who will meet them at their home or place of employment.

Faculty Strategies

Ideally our experience has been that the best teaching faculty should be the ones selected for the distance courses. Each new course at Laurier has an academic advisory committee. When courses are developed the material is prepared so it is transparent between faculty, ideally with two faculty assigned to each distance course.

Two or three audio conferences per term enable students to ask questions and discuss the course in a classroom-like setting. These conferences are voluntary but we achieve an 82% participation level.

The individual student course evaluations are summarized by course on a computer print-out. Each course the evaluation is compared with the overall evaluation results during all courses offered for that particular term. This comparative data is then, where appropriate, discussed with the faculty.

The faculty are paid an extra $15.00 per student for each student who writes the final examination. This encourages the faculty to follow-up on those students who are falling behind and maintain faculty student contact.

Institutional Strategies

The university needs to be perceived as actively and positively supporting distance education. A number of areas will be discussed including a day-long workshop for distance education students, the distance education advising tutor, computerized record keeping systems and the importance of trained, informed staff.

Summary

Overall, from the broad mission statement to the individual day-to-day efforts, the organization needs strategies that assess and support distance learning if it is going to be successful.

Using a Computer-Based Learning System As an Inexpensive Alternative Delivery System in Long Distance Education

Linda M. Wang
Clate Sanders
Department of Media Development
Georgia Center For Continuing Education
The University of Georgia, Athens, GA

Abstract

An experimental distance learning system developed by the Georgia Center for Continuing Education at The University of Georgia allows a professor to simultaneously teach a course in applied descriptive statistics at two different sites. A computer-based distance learning system was developed so that lectures held at the campus site in Athens, Georgia were simultaneously received at the campus site in Augusta, Georgia through the use of a conference phone and two Apple Macintosh computers connected by a modem. HyperCard stacks were used to present the text and graphics projected simultaneously on overhead screens at both sites with LDC projectors. This approach to long distance education was an experiment to investigate an inexpensive and convenient course alternative for the students at the off-campus site in Augusta, Georgia that would be as effective as a course taken on site with the professor. The results indicate that this computer-based distance learning system can be an effective way to teach courses without resorting to the expense of a video teleconference or requiring the inconvenience of having students commute to the campus site for classes with the professor.

The Use of Computers in Long Distance Education

As distance education is increasing in popularity, it is starting to emerge as an important force in education. The use of computers as part of this trend is an important issue as computers can expand the possibilities that distance education can offer to a learner. Classifying the developments in the technological delivery systems in distance education is described by Garrison (1986) in terms of four different dimensions (Figure 1). These dimensions are:

1. Mode/communication channel (the visual or auditory sense and the medium used for instruction and communication),
2. Delivery system (the means of communication),
3. Method of instruction (group or individual),
4. Mode of delivery (synchronous or asynchronous communications).

Garrison (1986) has identified three generations of technological delivery systems: correspondence courses, teleconferences, and computer-based instruction. Lauzon and Moore (1989) augment this with a description of a fourth generation technological delivery system. They delineate and classify this fourth generation based on Kowitz and Smith (1987) according to the two dimensions the density of content to be learned versus the types of human interaction; see Figure 2. They view that the successful application of a fourth generation delivery system depends on understanding how these technologies can be used to enhance distance learning and the different types of instruction. Lauzon and Moore consider fourth generation systems that are based on the first form instruction will be dependent on the Personalized System of Instruction (Keller,1968) and Computer Assisted Learning. They consider that computer conferences will be an important aspect in the second and third forms of instruction involving either electronic mail or computer conferencing systems. Garrison, Lauzon, and Moore consider each system in the succeeding generation as building upon the predeceeding generation and not as a replacement system.

Generation	First	Second	Third	Fourth
Medium	Correspondence	Teleconferencing	Computer-Based	Computer-Based
Message/ Communication Channel	Print/Visual	Audio/Auditory	Video, Audiovisual, and Auditory	Video, Audiovisual, and Auditory
Delivery System	Mail	Communications Network	Computer Terminal	Computer Terminal and Communications Network
Method of Instruction	Individual	Group	Individual	Individual and Group
Mode of Delivery	Asynchronous	Synchronous	Asynchronous	Asynchronous

Figure 1. Technology and Media in Distance Education. From Lauzon and Moore (1989).

Forms of Instruction	Assumptions	Control	Functions of Learning Activities
First	Learner has little if any knowledge	Instructor	Acquiring symbols, methods, and relationships used in the field of study.
Second	Learner skilled in the basics	Instructor/ Learner	Acquisition of useful technical abilities
Third	Learner skilled in the field	Learner	Seeks leading edge of current knowledge and seeks to go beyond it.

Figure 2. The Three Forms of Instruction According to Kowitz and Smith (1987). From Lauzon and Moore (1989).

However, the classification system outlined by Lauzon and Moore (1989) views the mode of delivery for the fourth generation of technological system as being asynchronous in time. This asynchronous nature is considered as an advantage because of the ensuing flexibility in the system. The mode of delivery for the third generation system of computer-assisted instruction is also described as being asynchronous. If one wants to use the computer in long distance education in a synchronous mode then the resulting envisioned system cannot be so eaily categorized according to this classification of generations of technological delivery systems. The computer-based learning system that was developed at the Georgia Center for Continuing Education tries to answer the real problems of simply and inexpensively teaching a class through long distance education where the mode of delivery is **synchronous**, the method of instruction is **group instruction** and the delivery system offers some form of **immediate** interaction between the instructor and the students.

A computer-based distance learning system was developed so that lectures for the applied statistics course held at the campus site in Athens, Georgia were simultaneously received at the campus site in Augusta, Georgia through the use of a conference phone and two Apple Macintosh computers connected by a modem. Even though the students at the site in Augusta only saw the HyperCard computer screens and could only hear and talk to the professor, this long distance class format is similar to a video teleconference format. In a video teleconference for a long distance class, a site is linked up "live" to

another site or sites where the teacher giving the lecture is seen and heard by the students in the off-campus sites. If there is a two-way communication setup, the students can interact with the teacher during the lecture with questions and discussion. Whereas a video teleconference is downlinked to other sites through the use of satellites, this computer-based learning system can be delivered to other sites inexpensively through existing phone lines. Even though a video teleconference offers the advantages of a televised format where the learners can see the teacher, the computer-based learning system can offer a viable alternative when there are budget restraints and when a course needs to be offered at an off-campus site during the same session the course is given on-campus but a teacher isn't available to teach at the off-campus site.

However, how should this alternative approach be classified? This computer-based learning system uses computers in a conference-like format, but it is not like the computer conference systems which were discussed by Lauzon and Moore. This system offers the advantages of communication that computers linked up through modems and conference phones can offer but what it delivers is the traditional classroom lecture... in an innovative way. Based on the technological delivery systems classification scheme described earlier, this computer-based learning system would be part of the fourth generation involving the first form of instruction but the mode of delivery here is synchronous, not asynchronous as described in their classification scheme.

The Computer-Based Learning System

During the university's winter quarter of 1990, Dr. Stephen Olejnik, of the Department of Educational Psychology at The University of Georgia, taught two sections of his class in applied statistics at campus sites 100 miles apart at the same time. He used the computer-based learning system consisting of a conference phone and two Apple Macintosh computers connected by a modem. The class met twice a week; the Athens section met in a classroom at the Georgia Center for Continuing Education in Athens while the other section met in a classroom at Augusta College. The two computers were linked with Farallon 9600 baud modems using the screen-sharing communications program Timbuktu/Remote. Both classes watched a projected Apple Macintosh computer screen where the text and graphics presented by the HyperCard stacks were simultaneously seen in both classrooms. Dr. Olejnik used a hand-held microphone for his lectures in Athens and the class in Augusta heard these lectures through a conference phone connected to a speaker. The students in Augusta could use their site's microphone to talk to the professor. The system was developed with hardware that is easily available on many campuses and was designed such that the technology can be easily used by both the instructor and the students.

Evaluation and Comments

The students at both class sites were given a questionnaire to fill out at the end of their course. Twentysix of the thirty questions used the Likert scale to categorize the possible responses. A 1 to 5 scale was used with the range of responses being "1" equaling "strongly disagree" to "5" equaling "strongly agree". Appendix 1 lists the ten questions which deal directly with the course using the computer-based learning system; they ask about the effectiveness or helpfulness of various aspects of the computer-based learning system.

For seven of these questions, seventy percent or more of the students as a whole answered "agree" or "strongly agree". For the other three questions which dealt with the use of the two-way conference telephone, the percentage of students who answered "agree" or "strongly agree" was similiar to the percentage of students who answered "disagree" or "strongly disagree". However, when the responses for these three questions regarding the conference telephone are examined by class site, we see that the Augusta off-campus class answered almost all of them with either "agree" or "strongly agree". This discontent from the Athens class was also reflected in the written comments. All of the negative

comments concerning the conference telephone were made by students at the Athens site; the few comments made by students at the Augusta site requested that a second phone line be installed as a backup for the conference phone.

In their written comments on the computer-based learning system, the students commented upon the need to improve the stability of the linkup for two-way conference phone setup. Most of the students liked the HyperCard stack format for the lecture material but they wanted a "computer chalkboard" for the professor to work problems on.

One of the most important questions was Question 26 which dealt with the acceptability of substituting the professor in the classroom with the computer-based learning system consisting of the computer and the conference telephone. All of the students in the Augusta off-campus class answered this question with either "agree" or "strongly agree". Their comments were also complimentary about this long distance educational setup. Four of these twelve students wrote that the most valuable aspect of the course was "not having to drive to Athens". One student wrote "There was no "difference between the Augusta class vs the Athens class. Not seeing the teacher (I found) was not an issue. The nature of the material, handouts, homework, and overheads kept the pace stimulating. I was extremely satisifed with the course!".

Although there were several minor problems with implementing this computer-based learning system into a classroom situation, the students overall rated the course very favorably. Most of the written complaints over the computer-based learning system came from the students in the Athens class and were over the slowness of the presentation of the computer screens during lecture, the annoying disruptions because of the unreliability of the phone lines for the computers and the conference phone causing, and of the need for a "computer chalkboard". The students in the Augusta class gave both the course and the computer-based learning system very high marks.

With regard to the students' grades, the grade distribution for both classes were similar to each other and similar to preceeding classes. The Athens class had 20 "A's", 12 "B's", 2 "C's" and 1 "withdraw"; the Augusta class had 7 "A's", 3 "B's", 1 "D", 1 "withdraw", and 1 "incomplete". In this aspect, it seems that using this computer-based learning system for long distance does not put the students at a disadvantage in succeeding at their coursework.

Conclusion

Several changes were made to improve the course during that winter quarter and for the next course in the series which was offered Spring Quarter 1990. The problem with the unreliability of the phone lines was solved that same quarter when dedicated phone lines were installed. The request for a computer chalkboard was fufilled for the next course in the series when the computer-based learning system was augmented with a graphics tablet which uses a light pen. This approach to long distance education was an experiment to investigate an inexpensive and convenient course alternative for the students at the off-campus site in Augusta, Georgia that would be as effective as a course taken on site in Athens, Georgia with the professor. The results from the applied statistics course given in Winter Quarter 1990 indicate that this computer-based distance learning system can be an effective way to teach courses without resorting to the expense of a video teleconference or requiring the inconvenience of having students commute to the campus site for classes with the professor.

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Appendix 1
Questions from the questionnaire specifically dealing with the computer-based learning system.

15. **The material in the HyperCard screens was easy to understand.**

16. **The hand-outs of the HyperCard screens were helpful for me during lecture.**

17. **The hand-outs of the HyperCard screens helped me to learn the material outside of class.**

18. **I could easily read the overhead projections of the HyperCard screens during lecture.**

19. **The pacing of the HyperCard screens during the lecture was appropriate.**

20. **The use of the computer and the HyperCard screens provided sufficient supporting material to the lectures.**

23. **The two-way conference telephone was an important aspect of the course.**

24. **I could clearly hear the lectures over the two-way conference telephone almost all of the time.**

25. **The two-way conference telephone was easy to use for communicating with the other class site.**

26. **Using the two-way conference telephone and the Macintosh computer with the HyperCard screens was an acceptable alternative for presenting the lectures without having the professor at the site.**

Training for Teaching on Television: Some Issues & Suggestions

Helen Lacy
General Manager of KULC
State Telecommunications Operation Center (SETOC)
State of Utah
and
M. Winston Egan
Educational Tel Communications (ETC)
Department of Special Education
University of Utah

Introduction

Distance education via telecommunications technologies is currently very popular. It can be effective - both educationally and in terms of cost - if it is well formulated and executed (U.S. Congress, 1989). But even before training personnel, even before planning the facility or purchasing and installing equipment, administrative and educational goals for distance education should be reviewed. Additionally, basic policies and procedures should be established that guide as well as foster the development and implementation process (McCleary & Egan, 1989). Among the issues that should be considered are ownership, faculty rights and compensation, developmental responsibilities including course and faculty selection, available resources, and support personnel.

Ownership Issues

Whether it is a single program or a telecourse, who owns the intellectual property? The university, college, or school district which initiates distance learning might be considered the owner, but the sponsoring department, academic department, or the instructor might also have ownership rights. Or, all of the above entities may share in the ownership. Ownership issues must be addressed prior to the development and production of a program or telecourse.

Compensation is also a factor in determining ownership. Who will be compensated? For what work will instructors be paid and how will they be paid? What will be the source of the funds used for compensation? In addition, who will pay for the development and production costs associated with the telecourse or program?

Once ownership is determined, what rights do each of the concerned entities have with regards to the program or telecourse? What rights do each of the parties have to videotapes and other course materials which may be developed to support the distance education efforts? Some of these rights might include the right to re-use materials and videotapes, including a definition of what kind of alternative uses are appropriate for a program or telecourse. Who has the right to alter videotapes or support materials; to withdraw materials from use? Who establishes course grading criteria? Are there any students' rights with regard to the materials?

Developmental Responsibilities

Who will be responsible for which activities in the development of distance education courses? These activities include the selection of courses and instructors, and the development of course content and related instructional support materials. Who will advertise and market the courses? Who will produce the courses? Who will distribute the courses, and what delivery systems will be used? Who is responsible for course management, including selection and payment of facilitators and/or teaching assistants? Who is responsible for the collection and distribution of assignments, examinations, grades, etc.? The development of quality instruction for distance education through television requires a team effort; a collection of instructional and technical personnel who collaborate in creating engaging, well designed programs and courses.

Resources

Potential telecourse teachers need to be aware of the resources that are available to them. What kind of research and teaching assistance can instructors expect? What kind of production and technical support is available? What levels of production quality will be maintained? What are the capabilities of the facility where courses will be produced? What kind of support is available or required for course management (disbursal of course materials, collection and disbursal of assignments and examinations, grading, etc.). Is it mandatory for accredited teachers to be in remote classrooms at all times?

Criteria for Selecting Courses

There are many valid criteria for selecting courses for television distribution. Selection may be based on potential enrollments, specific community/college/university needs, and difficulties in staffing multiple sections of various high demand courses. Selection may also be based on unique business and technical needs for training in an area or region. Some courses may be selected solely on the basis of "showcasing" an institution or providing a public service.

Criteria for Selecting Instructors

Distance education courses require competent and yet entertaining teachers to achieve maximum instructional effectiveness. Instructors should be master teachers, skilled and sensitive communicators with a sense of professionalism; they should be very knowledgeable in content, organized, flexible, and able to adapt their course and style to distance presentation (Bradshaw, 1989). It is also essential that they be willing participants in the development and production process. Moreover, strong administrative support both for distance learning and for instructors' involvement in distance learning programs is essential to the success of development efforts.

After administrative considerations have been resolved, training issues can be addressed. Several questions may need to be answered. For example, is training mandatory? Who is trained? How and when are they trained? Who does training?

What is the duration of the training? Will there be follow-up training for experienced instructors? How will time spent in training be acknowledged or rewarded?

Who Should Be Trained?

All instructors who plan to teach on television should be trained to adapt the presentation of the content of their courses to achieve the greatest instructional benefits for students. This includes developing awareness of the unique aspects of group and individual communication at a distance, including the need to directly engage learners by tailoring the instruction to their perceived needs by facilitating both active and passive forms of instructional activity, and by opening broader avenues of communication (U.S. Congress, 1988; U.S. Congress, 1989). It also involves working to make the technology transparent so that learners are not distracted by the medium.

Production and technical support personnel who produce distance education programs play a critical role in assisting telecourse instructors. They are essentially surrogates for the student audience and should help present that point of view to instructors. Additionally, they are responsible for providing a visual focus that contributes to learners' abilities to assimilate information and concepts. They are also responsible for helping instructors "look good" and feel comfortable on television, which contributes greatly to their sense of well being in teaching/performing. Also, support personnel should be aware of opportunities to respond to unique instructor needs that may be related to using visuals more effectively, interacting more frequently with distance learners, and carefully coordinating what takes place during the transmission of each program or course session.

Facilitators play a critical role in distance learning (Hobbs & Osburn, 1989). Technical facilitators at remote classrooms or receive sites should be skilled in operating and trouble shooting reception as well as transmission equipment, capable of presenting guidelines for effective interaction (suggest how learners may interact effectively with their instructors), competent in proctoring tests, capable of referring learners to appropriate resources, knowledgeable about the course format, and proficient in dealing with common problems such as cheating, class decorum, late submission of assignments, and chronic absenteeism. Also, facilitators are responsible for ensuring that an appropriate learning environment is established and maintained at their site.

Facilitators who are content specialists should also know how to support course instructors, to aid students in pursuing various course objectives and completing periodic assignments, to encourage interaction, to use courseware associated with the class, and to give assistance related to the course content. In sum, trained and well informed facilitators contribute significantly to the learning of students (Hobbs & Osburn, 1989).

Key Components of Training for Teaching on Television

There are a number of key components in preparing instructors to teach on television. They include: experience with distance education, observation of preferred practices for distance education, provision of well designed support materials, analysis

of brief teaching episodes, involvement with experienced television instructors, provision of direct experience in teaching/presenting, and provision of feedback. Each of the components will be addressed briefly in subsequent sections.

Experience with distance education. One of the critical ingredients of the training process is to provide potential instructors with an opportunity to be learners at a distance. This is achieved by having instructors spend a modest amount of their training time as distant learners. Rather than receiving all of their training in a "face to face" instructional environment, at least a third to half of their training is received in a "remote" site. In this site, they experience firsthand what it is like to be learner at a distance which heightens their awareness of the specific needs of distance learners.

Observation of preferred practices for distance teaching. Another essential ingredient of the training is the observation of effective presentation skills. Rather than merely talking about these skills and preferred practices, potential instructors directly experience these practices through their television trainers. Primary examples include: utilizing principles of instructional design to develop presentation and coordinated support materials; using interactive techniques that engage distant and local students; utilizing instructional approaches that elicit student participation and feedback (Johnstone, 1988); using pre-produced visual materials which are integrated into the presentation; using visual presentation aids such as models, maps, and chroma-key presentations; using a handbook to support the in-class discussion and facilitate notetaking; demonstrating appropriate presentation skills for television; and building distance education teams by combining production personnel and instructors who will eventually work together.

Provision of well designed support materials. Carefully constructed handouts or manuals which parallel presentations provide students with a means of developing their own "schemas" of understanding. They may also contribute to the nature and type of interaction that takes place during the learning sessions. After the training has been completed, these materials may be used as a quick reference and resource guide.

Analysis of brief teaching episodes. Instructors are given many opportunities to analyze and critique video presentations of other television presenters and teachers. Examples of appropriate and inappropriate instructional behaviors are presented for review and discussion.

Potential instructors are encouraged to look for adaptations that successful television instructors have made in presenting information and concepts. Additionally, instructors are encouraged to identify adaptations they will need to make in preparing to teach on television.

Involvement with experienced television instructors. Participants often profit from having an opportunity to discuss their concerns and questions with individuals who have successfully taught on television. Questions dealing with preparation time, administrative support, grading, and other related issues can be addressed in a relatively short time with experienced and talented television instructors.

Provision of direct experience in teaching/presenting. Instructors are given an opportunity to prepare and deliver brief, instructional presentations during the training sessions. Each presentation is videotaped and given to each instructor for review at a later time.

Provision of feedback. Instructors receive feedback regarding their presentations from peers as well as trainers. This feedback is delivered verbally as well as in writing following each presentation. Factors evaluated include: use of the humanizing elements (Parker, 1984), pacing of the presentation, clarity and organization of the presentation, engagement of the remote classroom audience, involvement of the facilitator, naturalness of the presenter, and overall level of enthusiasm.

Summary

There are many issues that need to be addressed prior to initiating training for teaching on television. Distance education team members and related administrative personnel should reach agreements and develop policies regarding intellectual property ownership, compensation, role assignments, resource utilization, and funding before training activities are begun. If these issues are not adequately addressed, the effectiveness and motivation for training will be greatly diminished.

Training for teaching on television is a multifaceted process. Critical components include: experiencing distance education firsthand as a learner at a remote learning site, observing trainers who model appropriate instructional strategies aptly suited for television, providing support materials that promote "knowledge building" and skill acquisition regarding teaching on television, analyzing instructional behaviors of skilled and unskilled television teachers, interacting with experienced and successful television instructors, engaging in brief, focused presentations designed to provide entry level teaching skills for television, and receiving feedback from trainers and peers in training.

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DISTANCE LEARNING BY SATELLITE: THE ROLE OF INDIVIDUAL DIFFERENCES IN PROCESSING AND MOTIVATION

Carol Speth, Ph.D.
Cherie Mercer, M.A.
John Poggio, Ph.D.
University of Kansas
Center for Educational Testing and Evaluation
Midlands Consortium Star Schools Project

Introduction

Midlands Consortium was one of four organizations granted two years of funding by the U.S. Department of Education for Star Schools Demonstration Projects. During the first year, which began October 1, 1988, Midlands Consortium installed satellite downlinks, microcomputers and related equipment in hundreds of school districts in Alabama, Kansas, Mississippi, Missouri and Oklahoma. One unique contribution of Midlands Consortium has been to establish a Research and Evaluation Center, physically housed at the University of Kansas. During the 1989-90 school year, the Research and Evaluation Center initiated a series of investigations, including one focused on the relationship of individual differences to learning in and reaction to courses by satellite. Other questions of interest included: (1) How do students low in motivation, low in academic skills or high in anxiety react to these courses? and (2) Do courses by satellite attract a different mix of students than conventional courses in comparable schools?

Theoretical Background

Individual differences affecting learning can be conceptualized in a variety of ways. This study's design was influenced by a heuristic model of student learning (Entwistle, 1987, p. 23) based on 20 years of research with college and secondary students in several countries. In Sweden, Marton (1975) interviewed college students about how they go about reading an academic article, and identified two levels of thinking, which he named deep and surface. Marton found that students' intentions regarding the learning task were inseparable from their processing activities (intention + process = approach). Some intended to reproduce the information to meet externally-imposed assessment demands, others intended to understand what the author was trying to communicate to them through the article.

Biggs (1978) in Australia and Entwistle in Great Britain looked at variations in study methods and motivations. Using self-report inventories, supported by interviews, they identified several types of (college) student learners. Entwistle deduced the four approaches: Meaning-Oriented, Strategic, Reproducing and Non-Academic. Each approach is characterized by (1) one kind of motivation or intention, (2) either organized or disorganized

study methods, and (3) either deep or surface processing. Later studies suggest that adult learners and secondary school students can be characterized in very similar ways. The deep vs. surface contrast holds up across geographic, linguistic and cultural boundaries, though there are small motivational differences. Students' approaches are influenced by contextual factors, including assessment demands, teacher characteristics and subject matter. A deep approach in science courses is somewhat different from a deep approach in social science or foreign language courses. Therefore, to be technically correct, one should talk about type of approach rather than type of student.

According to this way of thinking about individual differences, Meaning-Oriented students are intrinsically motivated, enjoy and value learning for its own sake, are actively involved with what they are learning, use evidence, relate new information to previous knowledge, and try to see relationships among ideas. Strategics are often just as capable as the Meaning-Oriented students, but less interested in learning for its own sake and more interested in playing the system to get good grades and employment qualifications. They are competitive, self-confident, have a high need for achievement, and often are very organized and methodical in their study habits. They will use a deep approach if that is rewarded by the assessment system. Students in the Reproducing subgroup try to memorize or rote-learn disconnected pieces of information, are motivated by fear of failure, and are not especially good at picking up cues as to what is expected of them. They are limited to a surface approach because they do not know any better; they are motivated to work hard, but become very discouraged. Non-Academics are unmotivated, uninterested in their studies, and disorganized in their study habits. Some lack both skills and motivation, others lack one or the other.

Applications of Student Learning Theory to Courses by Satellite

While students in the Meaning-Oriented and Strategic subgroups can flourish in courses by satellite, there are good reasons to worry about students characterized by a Reproducing Orientation, and in the long run, the success of these courses may be determined by how well they serve that larger subgroup. The ability of such courses to serve Non-Academic students is even more problematical, yet part of Star Schools' purpose is to serve "at risk" students. Bates (1988), on the other hand, suggested that instructional television can be especially helpful to "high risk" or "borderline" students, because it can furnish concrete examples of abstract concepts.

Many American researchers have tried to identify variables that contribute to achievement in terms of grades or test scores, but the foreign researchers cited here have found that students can do almost equally well using Meaning-Oriented, Strategic, or Reproducing approaches. However the quality of their educational experience, and their perceptions of the learning environment within a given course are quite different. We expected the Meaning-Oriented and Strategic subgroups to learn more or do better in

satellite courses than the other two groups, they always do; the question is whether the Reproducing and Non-Academic subgroups make progress or just fall further behind, becoming more discouraged and less motivated in the process. Bates' (1988) research at the Open University suggested that less capable students might need and appreciate televised instruction more than those who learn more easily from text. Information about how that large (Reproducing) subgroup learns from and responds to courses by satellite would be extremely valuable to instructors and producers.

Method

When schools subscribed for Midlands courses, they were notified by the producing institution (either Oklahoma State University or Kansas State University) that: (1) evaluative information would be gathered from the teaching partner and students enrolled in the televised class at select times during the semester/year; (2) the Research and Evaluation Center would coordinate the effort and would be getting in touch with them; and, (3) at no time would the data to be gathered identify their school or students, only aggregate data across school sites and courses would be reported.

Comparative conventional classes were sought by identifying and selecting a comparable course offered at a site that was receiving another satellite course. For example, if site A was taking AP Physics but offering their own introductory Spanish class, permission was sought to use the foreign language class as a comparison group against the satellite Spanish offering. It would not be appropriate to compare a conventional class in a big urban or suburban school to a satellite class in a small school in a rural area. This recruiting process was an attempt to identify equivalent groups and control for selection bias.

To secure the necessary data to address these research questions, schools subscribing to 11 Midlands courses by satellite were invited to participate. Over 225 schools in 20 states, 558 teachers and 4200 students in satellite or conventional courses participated.

Two student survey instruments were developed specifically for this study, but based on "About Me and My Schoolwork" and "About This School" -- used by Entwistle, Kozeki and Tait (1989) to study interactions between student characteristics and secondary school climate or "ethos." The first survey, administered last October, also called "About Me and My Schoolwork," asked students about their motivations and study habits in general, that is without special reference to the satellite or conventional class they were in. In April, students responded to the second survey, called "About This Class," which asked questions related to their perceptions of class climate, teaching characteristics -- both for TV and in-class teachers, workload, the degree to which the class emphasized factual assessment, formal achievement, or preparation for post-secondary study of that subject.

Students were also asked for an overall rating of the course; how much they felt they had learned; and what grade they expected to get in this course.

Data from the survey instruments are being subjected to factor analyses to see if their factor structures resemble those found in previous studies not involving satellite instruction and to see if the instruments might be simplified and shortened in subsequent studies. Factor analysis of "About Me and My Schoolwork" will also test the appropriateness of the scoring method used to sort students in both satellite and conventional classes into subgroups according to: (1) type of motivation, (2) either organized or disorganized study methods, and (3) level of processing.

This study concentrates on the dependent variables of workload, students' perceptions of the quality of teaching -- including the degree of supportiveness they perceived, and how much they think they learned in the course. The two independent variables to be considered here are subgroup membership -- based on scores from the first survey instrument, and method of delivery -- satellite or conventional.

Results and Discussion

Results will be available at the conference in August. Results will be organized so as to answer such questions as the following: Do courses by satellite attract a different mix of students than conventional courses in comparable schools? Are Meaning-Oriented (Strategic, Reproducing or Non-Academic) students in satellite classes significantly different in any of their incoming characteristics (including self-reported academic ability) from students thus classified who took the same course in a conventional class? If not, the following questions can be addressed. How do students who are motivated more by fear of failure than hope of success evaluate the teaching and the workload in satellite as opposed to conventional courses? Do students in the same subgroup expect to get lower grades in satellite as compared to conventional courses? Do they perceive satellite courses as being less supportive? Are they more overwhelmed by the workload than students of the same type in conventional courses? How much do students in that subgroup think they learned in satellite as compared to conventional courses? How do students with negative motivation and disorganized study habits react to satellite classes, and is that reaction significantly different from reaction to the same course taught in a conventional manner? Do students classified as Meaning-Oriented or Strategic consider satellite courses to be more challenging, and do they rate them higher than or about the same as students in the same subgroup who took the same course in a conventional class?

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Essential Strategies for Designing a Teleclassroom Training Program

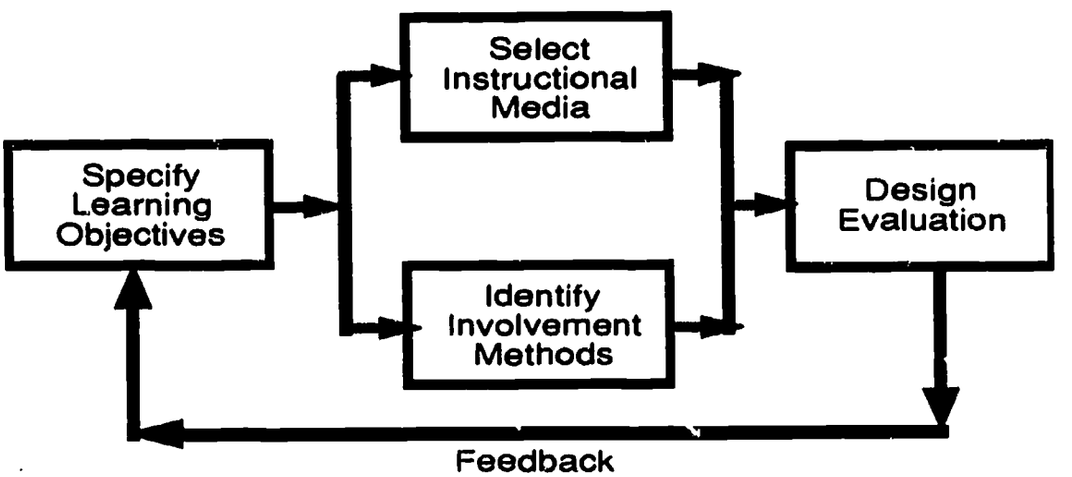
by Thomas E. Cyrs

There are a number of factors that are different from or more critical to teaching in a teleclassroom environment than teaching in a traditional classroom and include such things as: telecourse organization; use of visuals in TV format; oral presentation skills; looking good on television; use of Interactive Study Guides; questioning strategies to maximize student interactions; packaging a telecourse and consumer assessment of telecourses (Cyrs, 1989, and Cyrs and Smith, 1988). Of These skills, this paper will address the use of Interactive Study Guides with word pictures and strategies to maximize student interactions.

The element that distinguishes commercial television as an entertainment media from an instructional telecourse is involvement. A recent study of IBM video training programs concluded that.

"Interactivity is key to sustaining student interest in subject matter." (Douglas, 1989)

The need for involvement and interactivity does not just happen. It must be planned as part of the course design (Haughey, 1983; Dillan & Others, 1989; Thompson & Jorgensen, 1989; Jonassen, 1985; Porter, 1990; Massoumian, 1990; Johnson, 1989). The emphasis has traditionally been on the sender (instructor) of the communication rather than the receiver (student). Learning takes place when students become involved with the subject matter and does something with it rather than just sitting and listening. There are three types of possible interactions that take place--between instructor and student, between student and student and between student and media. An interactive instructional environment is described as one in which the instructor encourages active input and much involvement on the part of the learners. Given the importance of involvement it should be built into a teleteaching model:



Involvement could be initiated by the student, instructor or site facilitator during a live teleclass transmission.

Involvement strategies include such things as:

1. Viewing- The student is asked to view or observe events and process information mentally. Although this appears to be a passive activity, the student's attention is focused by statements such as—please note, watch carefully, did you see?

2. Writing- involves a physical as well as mental activity. The student is asked to fill in crucial words or phrases in an Interactive Study Guide, note observations, calculate solutions or write a brief description.

3. Read- The student is asked to read a brief article summary, notes on a handout, a worksheet or a page in a text. This is done as part of the teleclass. If the activity is directly related to the learning objectives, then it should be used.

4. Speak- This is the most involving of the activities. The instructor asks questions and strongly urges students to ask questions and comments on student ideas presented. This could also be accomplished by having students form discussion groups at the site and share their ideas with all sites. In the latter case the instructor acts as a moderator.

5. Combinations- The stimulus variations during a teleclass should be varied frequently to maintain student interest. How much time should be spent on these involving activities depends on the type of learning called for in the performance objectives. For example if leadership skills were being taught, it is important to go beyond cognitive skills and provide opportunities to make choices in leadership scenarios and to discuss the consequences of these choices.

Managing groups of students at different field sites through a variety of activities designed to maximize involvement can be a logistical nightmare. Even with the assistance of a trained site facilitator, an instructional management mechanism is needed. One such technique is called an Interactive Study Guide, which is a highly organized set of student notes, graphics, pictures, graphs and other involving activities which are used in conjunction with a live telecourse or with videotape in a self-contained and self-directed course. Key notes, phrases or other visual materials are printed in logical, numbered segments called displays. The student is required to respond in writing to questions posed by the instructor or to fill-in the blanks. This type of interaction allows the student to focus attention on the instructor and minimizes note-copying behavior (Cyrs and Smith 1989). A number of activities can be included in the Interactive Study Guide that provide directions to the student on how to proceed through the activity. A display could provide an example of a case study, directions to read an article or additional handout, short scenario, a problem to be solved, some type of small group activity, directions to view a short videoclip. The following scenario demonstrates how the Interactive Study Guide could be used to provide information in a short lecture and then how to involve your students.

Instructor: Today we are going to talk about_____for the next ten minutes. This information is covered in displays 1-12. At the conclusion of this lecturette please ask any questions on the topic covered.

Lecturette-10 minutes

Instructor: For the next twenty minutes I would like you to read the case study in display 13. Please form small groups of 4-6, appoint a spokesperson, identify several possible solutions and then make a recommendation. Your site facilitator will indicate to you when you have five minutes left. The spokesperson will then be asked to give a two minute summary of the solutions you identified and the recommendation that you are making. I will act as a moderator as each of our four sites report in.

Slide of instructor on monitor or electronic countdown device with/without background music

Each Site report in

Instructor comments on each report and asks for comments from the field sites.

The Use of an Interactive Study Guide Provides a framework and structure for managing students through a variety of activities designed to involve them in the learning process. The emphasis is where it should be—on the student.

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