EDUCATION ed AT A DISTANCE

Ed at a Distance

Magazine and Ed Journal

May 2001 Vol. 15 : No. 5

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# Editor's Podium

*Drs. Don and Elizabeth Perrin, Managing Editors*

*The most extraordinary change in human communication, the evolution of the Internet, swept the world like an electronic digital tsunami. We have all, willingly or not, been morphed. It is these new images of ourselves, communities, schools, families, commerce, and government that flood our consciousness. We have unparalleled opportunities to improve the human condition and we have incredible obstacles created by the very nature of this electronic web.*

*There is, however, probably no problem that will not ultimately be solved by breaking it down into manageable sections. Consider the SETI project to share the intelligence of thousands of PCs while they are idle to decipher radio waves from space in search of intelligent beings. As one pundit observed, - How do you eat an elephant? - One bite at a time. The caveat to all of us involved in the change is, in part, our different concepts of the future. This is as true for education and e-learning as it is for commerce, government, communities within nations and communities of nations.*

*Our position as communicators and educators is central yet tenuous in the digital world. We talk softly. We do not carry a big stick but a big electronic dictionary. We are painfully aware that evolution of a digital society evokes a world that is very different and that survival, both personally and professionally, requires a continual relearning and adapting to change. Ergo fas est - Therefore it is right!*
*Que sera, sera - So be it!*

*Don and Elizabeth Perrin, Managing Editors*
*ED at a Distance Magazine and Journal*

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# This Months Featured Articles



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**Editor's Note:** *Dr. Jukes, in a keynote address at the TechEd 2001 Convention, Ontario California, presented this research done by Dr. McCain and himself. The InfoSavvy Group is an extraordinary collection of research futurists, with visions of educational and institutional change that are unique, insightful and exciting*

# From Gutenberg to Gates
# Education in an On-line World

*Ian Jukes & Ted McCain*
*The InfoSavvy Group & Cystar, 2001*

### Synopsis

*As Gutenberg's printing press ignited the Renaissance, computers, the Internet and networking are igniting the Digital Renaissance, which will have a profound curricular and pedagogical effect on the near and distant future of education. This will happen whether schools, as institutions, embrace it or not because kids, teachers and parents will be accessing the Internet from home, at night, outside of the purview of the school. They, rather than our traditions, will ultimately influence the direction of the school and its curriculum.*

*What happens when the people outside of education who are building information infrastructures catch vision of the immense power of new technologies to deliver instructional goods to the DotCom generation? What will education look like as we make a major shift in the who, what, when, where, why and how of teaching and learning which will be a direct result of the arrival of the Internet? This presentation asks participants to reconsider education as we move from Gutenberg to Gates and beyond.*

### The Low of Unanticipated Consequences

*From time to time, someone invents a product with an unforeseen and massive impact on society. This has been true since the Chinese pounded linen to make paper, and unwittingly provided the mass means for disseminating and storing knowledge. This was also true a thousand years later when a Benedictine monk created the mechanical clock to regulate the hours of prayer, and accidentally paved the way for regulation of industrial production.*

*Then five and a half centuries ago, a German goldsmith and Gutenberg invented the printing press. Who would have predicted the impact of the printing press, which was initially devoted to publishing the Bible? Who could envision that it would someday be seen as a force undermining church authority? Who could have imagined that books, once owned by the few and treasured as symbols of wealth and power, would one day be accessible to the mosses? Who could have seen its ripple effect - the creation of a system of* *public schools that were organized primarily for the purpose of teaching children to read in order to help students absorb the knowledge that books contained?*

*The power of Gutenberg's press came from the information access it provided. This began the process of making religious information available to the masses. As Francis Bacon said, knowledge is power. Access to information eventually disintermediated the religious leaders of the Catholic Church.*

**What is disintermediation?**

*New technologies permit direct access to the source of information, services, or goods. Gutenberg's press allowed direct access for the masses to information that was contained in the Bible and other scholarly works. This was a highly disruptive technology, because it meant that church leaders were no longer the only means for access to the Word of God. In providing access, Gutenberg's press eventually disintermediated the church leaders.*

*For the masses Gutenberg's press gave the power to the people, and in doing so, turned the medieval world upside down, one caveat is that this technology took time (300 years) to have a pervasive impact. But in time, it fundamentally changed the relationship between the producer (the Church) and the consumer (the masses). This led to the Reformation and certainly contributed to the Renaissance.*

**And now it's happening again!**

*We are living in extraordinary times. The modern world is being turned completely upside down before our very eyes. This has primarily to do with the implications of with the appearance of microelectronics into our world. Microelectronics has led to the world of Gates. His meteoric rise in success simply typifies the astounding shift that is occurring today. The electronic phenomenon of the last 20 years has matured very quickly into an on-line revolution that has fundamentally changed our world. But there is a huge difference between what happened in Gutenberg's time and this time around because it is all happening in fast forward. We're now dealing with an accelerated rate of change - change that is happening not only quickly but also pervasively. In fact, things are happening so quickly that it's hard to understand what's going on or even recognize all of the implications.*

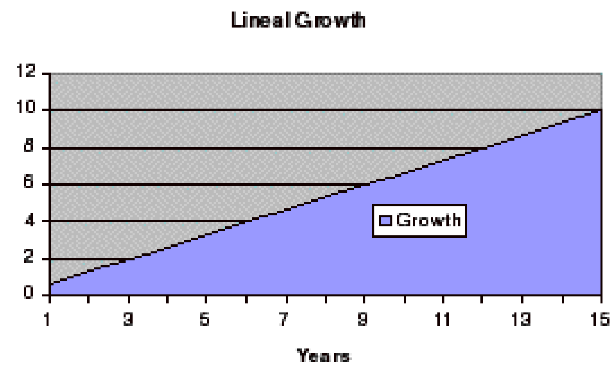
*Consider for a moment that the microelectronics explosion only happened 30 years ago -that the desktop computer only appeared 20 years ago - that the World Wide Web really only arrived about six years ago - or that wireless is just now appearing!*

*Even the rate of change is changing. We are beginning to see a major shift in the way that change occurs. We're shifting from incremental to exponential change. This holds profound implications for all of us.*

*If we are to deal with the profound changes we are experiencing in our lives, we need to stand back and take a longer view of things by considering what's really happening and how we can deal with its effects.*

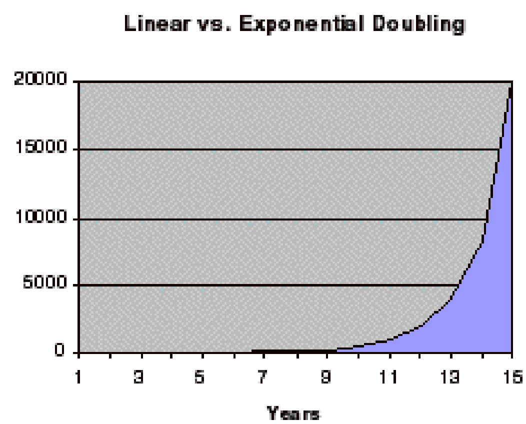
**Understanding incremental change**

*Consider for a moment the nature of linear growth. When things grow in a linear fashion, the growth is very predictable. If something were growing in a* *linear fashion, by a factor of one every 18 months, the linear progression would be 1-2-3-4-5-6. . Over 15 years this means that something would be 10 times as big, 10 times as fast. 10 times as powerful...*



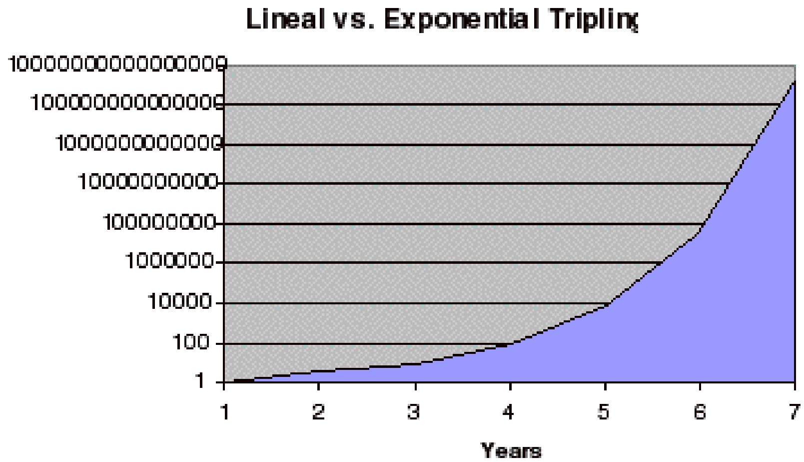

**Understanding exponential doubling**

*Now consider linear growth versus exponential doubling. If something were doubling in size exponentially every 18 months, the exponential progression would be 1-2-4-8-16-32... Over 15 years, this means that something would be 1000 times as big, 1000 times as fast, 1000 times as powerful ... an amazing amount of growth, a larger and larger amount of this happens as the power of the doubling kicked in.*




**Exponential tripling**

*Now consider linear growth versus exponential tripling. If something were tripling in size exponentially every 18 months, the exponential progression would be 1-3-9-27-81-243. Over 15 years, this means that something would be almost 20,000 times as big, 20,000 times as fast, 20,000 times as powerful ... and once again, a larger and larger amount of this happens as the power of the tripling kicked in.*




**Why is this important?**

*Exponential growth just hints of things to come. Consider some of the exponential growth patterns in our world. Consider Moore's Law, which states that technological processing power and speed doubles every 18 months. Consider Gilder's Law of the Photon, which states that bandwidth speed and capacity triples every 12 months. Consider the growth of the Internet, where the amount of traffic is currently estimated to triple every 12 months. And finally, consider what futurist George Gilder calls the Age of InfoWhelm. He estimates that the amount of unique new raw data is doubling every 18 months and projects that it will be doubling every 2 weeks within a few short years.*

*Exponential growth explains why the World Wide Web suddenly exploded into our view -why it fundamentally changed our world overnight- why it caught so many of us off-guard ... It was because the WWW was a development unlike anything we've ever experienced before.*

**So where are things going?**

*The exponential nature of our world tells us that we ain't seen nothing yet - that the changes in the next five years will absolutely dwarf the changes of the last 10,000. So how do you plan for environment of accelerating change? We believe that if we are to survive in the culture of the 21st Century, we must attempt to perceive the future from current trends, the biggest of which is technological convergence.*

**Technological convergence**

*Technological convergence happens when what have previously been separate technologies fuse together to create powerful and unique new devices. What's happening right now is the fusion of four powerful and distinct technologies. These devices are television, interactive real-time communications devices, computers, and networks. This is a fusion that is so powerful that we've been compelled to give it a name ... synercation.*

**Synercation**

*Synercation is the synergy of interactive communication systems. The significance of synercation is that the power of the whole is greater than the sum of the parts. Consider the effects of technological convergence. We have* *the content and presentation of television, the interactivity of communications systems, the processing power and speed of computers, and the global reach of wired and wireless networks. This has created a radical new means of communication. It must be noted that the power of synercation is that it's not just broadcast, it is interactive in nature.*

*Synercative devices are a disruptive technology - technology that is a great challenge to the status quo. Synercated devices are disrupting the established ways of doing things. They're having a far more pervasive impact than Gutenberg's press, but this impact has been compressed into six years.*

*It is not an exaggeration to suggest that synercative devices are turning everything in our world upside down, which has led almost overnight to a fundamental change in the way we do business, and changing relationship between the producer and the consumer. Power has shifted from producer to consumer. There are five reasons for the shift:*

**Enhanced Access**

*The real significance of Gutenberg's press was that it provided widespread access to information to the masses. Access to information had real power. Gutenberg's press upset the status quo. In much the same way, synercation has resulted in digital and information services now being readily available to the masses/consumers.*

*For example, consider the types of services provided by WebMD (www.webmd.com.) There is a growing body of medical information on the Web that comes from credible sites. These sites allow an uneducated person access to information that was previously available only to someone with a postgraduate medical degree. As a result, the power of information is now in the hands of the patient. Since the very latest information on a variety of health issues are widely and readily available to the patient, not just the doctor, this changes the way that doctors deal with their patients.*

*In the same way, consider mySchwab.com (www.myschwab.com). myschwab.com is a major money management firm (Schwab) which has created an alliance with a new media player (Excite). At the mySchwab.com web site, a subscriber can personalize the information they want to see: my business, my sports, my news, my weather, my travel. And soon, as the model develops, it will also be my bills, my medical records, my favorite music or just about anything else that the consumer desires.*

*As a result of synercative devices, consumers now have direct access to the source of goods and services: news, books, stocks, banking, businesses, and encyclopedias, disintermediating what had previously been the middleman. Consider for a moment the trading of stocks. Until only a few years ago, you had to be a member of a specialized club known as brokers to buy and sell stocks. Not anymore! Synercative devices have allowed the consumer to disintermediate the brokers. And it's the very same for selling cars, houses, insurance... The Web has broken business wide-open and had a disruptive/disintermediative impact upon those businesses amongst many, many others -and this has happened in just six short years.*

**Complete Freedom**

*Consider the way businesses operated in the past. Industrial Age businesses and institutions such as banks, insurance companies, department stores, drug* *stores and the like placed constraints on consumers by setting the hours/days for access to their services. People whose schedules didn't fit missed out. Today it is very different. Synercation is facilitating access to on demand digital services there available 24/7/365. People don't want a bank; they want access to their money when they want it. People don't want a newspaper; they want access to their information when they want it. They don't want access to stores; they want access to be able to purchase merchandise when they want it... and with the emergence of the WWW and synercative devices, they can now have it whenever/wherever.*

*Currently the services are still primarily tied to the desktop, but as we become comfortable with the desktop it is about to change radically once again due to the rising power and freedom of wireless services. Consider the service known as Vindigo (www.vindigo.com). Vindigo is a geographical tool and wireless survival guide to New York and several other cities in the U.S. Using a hand-held device such as a Pilot; consumers are able to access the latest information services, movie schedules, restaurants menus, theater reviews, and travel directions that they need. All are accessed and automatically updated daily and wirelessly through the use of a technology known as hot synching.*

*For most of us, this is a stealth trend. The availability of such devices and services really hasn't reached the personal radar of most people. This is primarily because the power and potential of wireless technology has been vastly underestimated. But not for long. A recent report in Time magazine suggests that wireless access to the Internet will pass desktop access to the Internet by the end of 2002. When we look at today's technology and services, as clunky and hokey as they may now appear, we must understand that they just hint of amazing things to come because of the nature of exponential growth. Things will happen much faster and more pervasively than any of us could ever expect. And for us as consumers, the bottom line will mean anytime, anywhere access to digital services.*

**Transparent Communication**

*The goal of technology is the transparent use of the device, where the main focus is on the task, not just a tool. Consider a pen. The only time we ever think about a pen is when it doesn't work properly or we can't find it. Once we have become pen literate, most of us are completely engaged with the task not the tool. Now consider where we are with new technologies. How do we communicate with new technologies? Up to now, this has mainly been through text output. We have communicated primarily by means of keyboard or mouse input. Being keyboard and mouse literate is critical. Being keyboard and mouse illiterate is a major obstacle to the easy use of technologies. That's because keyboarding is an unnatural act. For many, it's hard to learn to keyboard quickly and accurately. The natural means of communication is through speaking, listening and viewing, not typing and reading. Today, this is particularly a problem because more than 75 percent of the World Wide Web is a text-based. We must get beyond this focus on text-based environments if technology is going to be used by more people. There is hope...*

*I am writing this handout using a piece of software from IBM known as ViaVoice. ViaVoice is voice recognition software. After a short training period, I am now able to speak through a microphone directly to my computer at 100 to 150 words a minute and with more than 95% accuracy. While this technology is* *still very new and not perfect by any means (consider the difference between "recognize speech" and "wreck a nice beach") it is maturing quickly, and is now appearing in new devices.*

*Consider as an example the new DoCoMo 3G celleputer (www.ntt.com). This device has high-speed wireless access to World Wide Web and e-mail. At the same time, the device can be used to download money from an ATM in the form of e-cash or to upload e-cash to your child's version of the device. In the near future, it will also be able to be used to purchase items from a store, a pop machines, or publisher. But this same device also has a digital camera and a projection unit built in. It's able to hold video clips and e-books - to capture and play MP3 music downloaded from the Web, and to recognize speech. This latter feature will allow us to move from e-mail to voice-email. How long will it be before it will translate our words into Japanese, Spanish, or French? This is the type of technology that we have been referring to. Technologies that allow for natural communication and make us all like Captain Kirk.*

*Next, consider Ananova (www.ananova.com). Ananova is BBC's virtual newscaster - a digital personality, who reads the news on request, while speaking with inflection and using gestures. With many of our TV anchors now getting on, imagine the notion of a virtual presence, perennially young and ready to read the news whenever you are.*

*Although this technology is still new, consider the effects of exponential growth will have on such services and imagine where this will go. Meanwhile, Sprint is developing its own version of Ananova, known as Chase Walker. Also a virtual presence, Chase Walker exemplifies some of the elements of artificial intelligence, interactively answering your questions and chatting with you. While it's admittedly clunky now, you can't just see it for what it is today. In an age of exponential growth, you must try to visualize where this might lead tomorrow and to consider what implications such technologies might have for you personally and professional.*

*Today the multimedia revolution allows us to listen and view. We are on the cusp of adding interactive video, which will allow truly natural multimedia based communication. This development alone will bring a revolution to all of us. But, this is just the beginning. The problem for us is that it may be difficult to imagine or to accept that this might be in our future. But for our children, charter members of the Millennium Generation, understanding and integrating these technologies into their lives is a natural act because these devices are part of their native language. We are about to break the communications barrier.*

### Personal Comfort

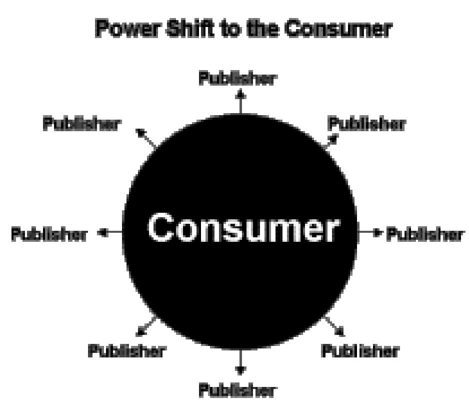
*Henry Ford said you could have an automobile in any color you want as long as it's black. In those times, whose comfort was it anyway? In the industrial world, producers, publishers, and broadcasters set the agenda and timelines. The mindset of mass production was that one size fits all, even if it didn't do that very well. Now synercated technologies are facilitating mass customization. Mass customization allows the product or service to be customized to the specific needs of each customer. You can have your car with whatever features, upholstery, or point that you want. You can have clothes custom made to your body, not some %%average" figure. You can progress through material at you own pace. You can link information together in any way* *that you want. You can follow you own cognitive links and learn when, where and how you learn best. As David Thornburg says these new technologies " allow people to move through conceptual space at the speed of light, and the speed of thought. "*

*Mass customization and new personal comfort allow us to get outside the traditional box of thinking about the possibilities. We don't have to conform to someone else's preconceived ideas of the order in which to process information, or how long it should take to understand something. But in order for this to happen, comfort with technology is critical. You can't overestimate the power of this aspect of synercation.*

**Individual Empowerment**


*A profound shift is taking place. It used to be power was in the hands of the producer. Now that power has shifted to the hands of the consumer. As an example, consider publishing. In the old days the publishers controlled the sources of information, the photographs, what was reported, where it was reported, and how it was reported. The consumer was not actively involved in this process - the consumer was largely expected to adjust to the whims of the publisher. If breaking news happened after the newspaper had been set, or if a game went past the deadline, it was too bad - you just had to wait until the next day to get the details.*

*Now, primarily because of the growing power of technology, the information is available anytime, anywhere for anyone. The power has shifted from the publisher to the consumer.*




*Just like Gutenberg press, this is once again upsetting the status quo. We now have a brave new world with brand new rules that are challenging the* *traditional assumptions about the established ways of doing things. As a result of this shifting landscape, many are bewildered, many are bankrupt, and many more are benefiting. But what implications do these developments have for education?*

**Instruction will not be exempt**

*Synercation meets learning. These new developments are already having a profound impact on learning outside of formal education. Kids and working people alike are already comfortable with on-line learning, despite the fact that the on-line world remains largely text and graphics based, and despite the fact that it is further limited by existing bandwidth. In spite of this, increasingly people don't wait to be given the information. Increasingly if they need it, they'll use new technologies to find it.*

**Considering the future of education**

*How do we do our jobs? Why are we successful? What gives us our edge? It's our ability to communicate. It's our ability to interact. Until now, there has been no serious alternative to what we do and how we do it. But that's about to change. Let's consider how the five aspects of synercation will impact learning ...*

**Enhanced Access**

*Synercated devices provide opportunities for new experiences. Learners can access information from more than one source and from more than one perspective. Reality can be augmented by access to virtual experiences and virtual expertise. Consider for a moment how many elementary students are hindered by a teacher who doesn't have a strong science background. And then consider the growing wealth of information available on the World Wide Web. Learners can access things that augment the classroom experience. But it won't stop there ...*

*While these new ways of doing things are powerful in and of themselves, exponential change tells us that much more will arrive very soon. New technologies will allow us to have truly interactive on-line multimedia learning experiences complete with the power to follow cognitive links. As an aside, when I was a child, I had my knuckles rapped by Miss Jones, my classroom teacher, because I had the audacity to read page 58 while the rest of the class was only on page 56 - I got it doubly hard because I had skipped page 57.*

*Today if someone was to tell me that I had to wait to find out, I would simply go out and find it for myself. For today's learners, it doesn't really matter where or who they get from as long as they get. Whether it's from the Internet, a chat line, or some other digital service they will find out what they need, when they need it. As new technologies continue to grow in power, access to new on-line experiences will redefine instructional delivery.*

**Complete Freedom**

*Consider for a moment the barriers to learning. How many of you know a student who couldn't or wouldn't attend school because they were having a bad hair day, they couldn't find the right clothes, were dealing with personal issues or were upset about their complexion. Complete freedom means being able to learn wherever you are. This includes learning a home, learning in the community, learning in the workplace, learning while traveling - all the while* *connected through your own wireless, tiny, pocket technology. Complete freedom means the ability to learn any time. Some of you may notice that teenagers occasionally like to stay up late at night and would prefer to sleep until noon. Yet, we continue to have early-morning classes, many of which contain students who were there in body but certainly not in mind. Synercative learning allows for learning when it is best for the learner. Whether this is at 3:00 p.m. or 3:00 a.m., it really doesn't matter.*

**Transparent Communication**

*Transparent communication allows for natural input. For students, using these new technologies is just like us using a pencil. For us, the pencil is transparent. For them the technologies are transparent because they are completely comfortable with them, so using them allows us to engage them in their comfort zone and native language. If truth be known, there are many students who are anxiously waiting for the CD or Web version of school so they don't have to put up with the perceived indignities of life at school.*

*Beyond this, consider for a moment interactive chat lines. How many of you use them? Oops, wrong group! It's not in or for our world. Now ask your students how many of them use chat lines and are involved in on-line communities. You'll be absolutely shocked at how many are completely comfortable operating within online communities and use those communities when they need assistance or advice.*

**Personal Comfort**

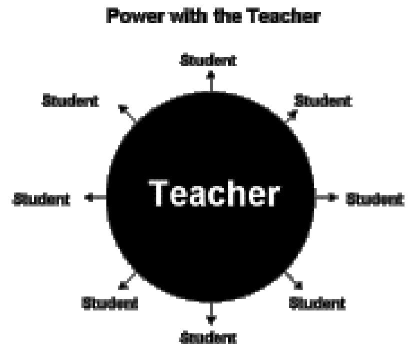
*Should is a powerful and devastating word. Have you ever heard a teacher say, "You should be able to keep up with the rest of class. You should be able to understand this. You should know this."????*

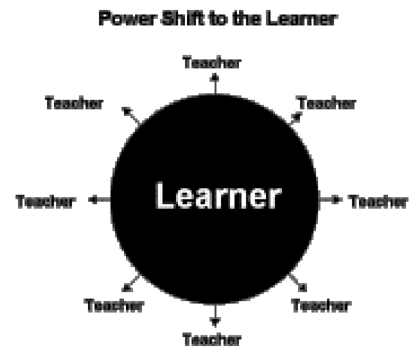
*Consider math. In many cases, it's not that students can't do the work, it's that they can't do it fast enough to keep up with the teacher, or the class, or the curriculum. In the traditional educational model, time has been the constant and thus learning has become the variable. It's just like a 100-year dash. Not everyone can run 100 yards in under 10 seconds, but given enough time, most people can finish 100 yards, whether they run, walk or wheel, it. The problem with the current educational system is that there is simply not enough flexibility to customize learning to the needs of each individual.*

*But new synercative technologies can empower individuals to learn at their own pace so that students do not have to be intimidated by the fact that others learn at a quicker rate or seem to know more. Synercation allows the learner to use all of their intelligences to learn information in a different sequence or a different manner than the instructor. As a result, the learner is not constrained by the assumptions or training of the instructor. What's more, learners are able to make links to alternative learning experiences and alternative learning contexts. They can learn at their own rate and wherever they feel most comfortable, whether that happens to be at home, at school, or somewhere else.*

**Individual Empowerment**

*In the past, all of the power was with the teacher. They were in control. They brokered the sources of information. They defined where instruction was presented, when it was presented, how it was presented, and how learning was assessed. The learner was not actively involved in this process. The* *learner was required to follow the lead of the teacher.*




*But now, we are beginning to see a power shift to the learner, who has direct access to sources of information and instructional services. This shift is leading to the disintermediation of traditional classroom educators/institutions. Increasingly, the learner decides when they want to learn, where it's presented, and how it's presented. The learner becomes actively involved in the process. This is a radical shift in thinking away from of the traditional teacher /learner relationship and educational delivery systems must now increasingly adjust to the consumer*

*Just Iike with Gutenberg's press, it's happening again. Modern Iif e is changing profoundly and quickly, upsetting the status quo. As a result we now have a brave new world with brand new rules that are challenging the established ways of doing things. There are equally profound implications for learning.*

**What will learning look like?**

*There are many questions to consider. Who will provide instructional services in the future? Can schools move quickly enough to catch this wave and not be engulfed? In answering these questions, it's critical that we recognize that the real issue is not technology, but the mindsets that operate behind the technology.*

*Consider the music industry. Why has Napster been so successful? (For those of you who have been on another planet for the last few years, Napster is the Web based service that allows an individual to search the Internet for a specific song by a specific singer or group, and then download it -at no cost - to a computer) Napster has been successful because it provides enhanced access along with complete freedom as to how the music is presented. No longer must the music be presented in the format provided on the CD. When downloaded to a computer, the music can be burned to a CD or hand-held device, complete with a mixture of performers in a customized song order. All this from the* *comfort of a living room, office or bedroom. It is this personal empowerment that typifies synercation. Naturally, this development has been a great upset to the established way of doing the music business and a dangerous challenge to the monopoly of the big five music distributors.*

*So you might ask, why didn't the music distributors see it coming? The reason is that there has been long time stability in the music industry, which led to a well-established mindset for how things got done. This long-standing stability led to resistance to new ideas. How do we know this? Look at the reaction of the music companies. First they ignored Napster. What possible threat could there be from a 19-year-old kid and a simple piece of software? Then, when they were suddenly confronted with the fact that thousands of individuals around the world were sharing and exchanging millions of music files, all at the same time, and without paying the producers, the music industry tried to shut Napster down. As David Thornburg says, they were caught with their paradigms down because didn't grasp the implications of synercation on the music industry. But for the consumer, when they discovered what the technology was capable of doing, they were hooked and the genie was out of the bottle. There was no putting it back in.*

*For the consumer this distribution model provided too much power, too much freedom, too much access and too much comfort. Any attempts to shut them down will only results in 10 more services being there to take their place.*

*And that's not all. There's more to this story. Well-established mindsets also lead to opportunities for others who are able to think outside the box. That's where Napster came from.*

*They simply moved into a gap left by the slow-moving music industry. The key difference was mindset. The developers and promoters of Napster understood the vision of empowerment that came from an understanding of the new technologies and the implications of exponential growth. They understood that they had to move quickly or run the risk of being left behind. In reality, the story of Napster is a drama of a mindset that is playing out right before us.*

*The clash of mindsets was between those who did not see the future, and thus tried to shut Napster down; and those who understood where things were heading and used Napster to enable the change. Suddenly, the Bertelsen Group (BMG), the third largest music distributor in the world, broke with the rest of the big five and announced that they would use a partnership with Napster to provide online music sales. (Note, this was not done for altruistic reasons. They did it because they understood that kids were willing to pay up to $15 a month for the right to download a wide range of music.) Right now, most people in the music industry think that all this will do is augment the traditional methods of music sales such as CDs.*

*BMG understands that while this may be the case in the short term, this will inevitably lead in the longer term to a complete and sudden shift in the nature of music distribution. Not replacing distribution, but redefining it, and leading to a digital Renaissance in music distribution. BMG just wants to be there first.*

*So what? At this point, some might ask what this has to do with education and educators? Let's ask some simple questions about education. Do we have a long-term established mindset about what education looks/should look/will look like? Are we quick to embrace new models of education and technology? Does the slowness of the system provide opportunities for others with different* *perspectives on how to effectively provide instructional delivery? Will synercated technologies significantly impact our business?*

*It may be a surprise for some of you to learn that this is already happening. We're already seeing the results of our slowness to respond. Over the course of the past few years, hundreds of interactive, on-line multimedia sources and electronic encyclopedias have appeared. Companies such as Classroom Connect, the Discovery Channel, the Sylvan Learning Network, and CNN (amongst many others) are already providing on-line and virtual learning experiences to learners. Consider that the University of Phoenix, an all but virtual university, is now in 43 states and counting.*

*There are now estimated to be more than 5000 on-line degrees available from universities and colleges around this nation to learners. Virtually all of them require little or no attendance on campus. Do you think that this figure will go down or up over the next few years?*

*For people who work at the post secondary level, this development has been very disruptive. Synercative technologies and the services they can provide are seen as a serious threat to the longstanding monopolies that most colleges and universities have traditionally had. For many post secondary institutions, this is seen as a great threat to the status quo. Can K-12 education be far behind? There are many who say that this will never happen because nothing else has been able to move K-12 education out of its traditional roots. But this is only the beginning. Let's consider for a moment where this is heading.*

**Imagine for a moment...**

*What if Napster puts K-12 education in its sites? What would happen if we moved to a model of peer-to-peer learning? What would happen if we moved to a model where learners searched on-line for learning resources using a Napster-like service? What would learning look like?*

*Let's consider for a moment students who comes home with their homework. Imagine that they need help in writing a report, understanding the Declaration of Independence, comprehending osmosis or interpreting the artwork of Picasso, but they don't have immediate access to the expertise of a classroom teacher. Imagine that instead, they log on to a Napster-like service and do a global search for expertise in their desired area from all of the users and resources organized by this service*

*The search provides a list of free and for-fee sources of instruction from around the world. The student identifies an appropriate resource and downloads or runs an on-demand on-line digital lecture. The student listens, pauses to take notes, replays parts that they don't understand, or jumps back or ahead to increase that understanding. (As an aside the kinds of services that this could provide have profound implications for the voucher debate and it doesn't stop there ... but that's for another day and another time.)*

*Now let's consider using Ananova as a tutor. How about a student with math homework who needs help understanding trinomial equations. The student calls up an Ananova, an on-line interactive virtual math tutor and asks questions of her. Ananova responds with a detailed explanation complete with facial gestures, and then waits for verbal confirmation from the student that the concepts have been understood before continuing. At the same time, Ananova also provides graphical representations of how trinomial equations are used in* *the real world, and provides connections on the Web to real life illustrations of work that uses trinomial equations. Is this possible? Not just possible, an absolute certainty.*

**Are there any implications for educators?**

*Many people think this will never happen. That change is something that happens to steel workers, to farmers, to automakers - that it will never have any effect on schools. Meanwhile, others believe that this will in due course replace the need for teachers. Now we happen to believe that the most powerful technology in the classroom was, is and will remain a classroom teacher - a teacher with a love of learning, an appreciation of the aesthetic, a deep understanding of how children learn. We further believe that we could put a state of the art piece of technology on the desk of every teacher and student in the country, and if that's all we did, the only thing that would change would be the power bill. But we also believe that any teacher who can be replaced by a computer deserves to be.*

*Do you find it hard to believe that there may be some who actually think that computers could replace teachers? Have you ever noticed that sometimes decisions are made for other than sound educational reasons - reasons such as profit, politics, or philosophy?*

*One thing is certain, whatever happens this is an in-your-face technology. In the same way that synercation has changed business in the past six years, the interactive power of synercated technologies will compel us to articulate why kids have to come to school at all. Now there many reasons why students should come to school, but we've always taken the fact that students would always come to school for granted. In doing so, we ignore at our peril the potential of these technologies to first augment and then transform our educational models. Our greatest challenge is to see this as an opportunity and not a threat, because like it or not it's coming at us like a freight train.*

**The genie is out of the bottle**

*There is in no putting it back because people thrive on what this kind of technology provides. Synercation shifts the power to the learner, allowing learners to make connections freely and be in control of their learning. Be clear that it is not replacing, but redefining instructional delivery. Ready or not, it will lead to a digital Renaissance in educational services.*

**So what's your response to this?**

*You have seen the future. What are you going to do about it? Synercation will have a profound impact on learning whether you like it or not, whether you are ready or not. Will you be the first act upon this knowledge, or will you wake up being only spectators as others pass you by with new and powerful services?*

*Will you boldly embrace the new services that are disintermediating traditional classroom teachers? Will you catch the vision like BMG has, and embrace strategic partnerships by connecting with those who have content for this new medium? Because if you won't, who will? Will it be Bill Gates, the Discovery Channel, AOL/Time Warner, Classroom Connect ... or someone else?*

*And if you think that we're crazy, consider the impact of synercation on businesses in the past five years. Education is next. You have a great opportunity to shape the future. Are you up for it?*

**Change is hard!**

*Just like with the music industry, this is a drama of mindset. It's a very hard to change the collective mindset of the school system. It's easy to the complete sense of hopelessness.*

*We understand that change is hard - that change is messy - that change is uncomfortable! Given this, it's very easy to throw up our hands and walk away with a complete sense of overwhelm and hopelessness. How can we overcome this feeling? Let's digress for a moment. Consider the blue whale, the largest mammal on earth. It's the length of 3 Greyhound buses placed end to end, it weighs more than a fully loaded 747, and it has a heart almost the size of a Volkswagen Beetle. A baby blue whale is estimated to gain 60 pounds an hour from birth to one year old. A blue whale is so big that when it decides to turn around, it can take up to 5 to 7 minutes to turn 180 degrees. Now there are a lot of people who draw a strong parallel between blue whales and schools. Both of them seem to take forever to turn around. From this perspective it seems hopeless, doesn't it? But now it's time to shift our mind set. Let's compare a blue whale to a school of sardines that can have the mass of dozens of blue whales. Unlike the whole, a school of sardines can turn almost instantly. How do they do it? Is it ESP? CB radio? The Internet. None of the above. If you take a closer look at this phenomenon, what you notice is that although all of the fish appear to be swimming together, in reality a small number of fish are beginning to swim in a different direction. As they head off on this new course, they cause conflict, friction, and collisions with the other fish. But when a critical mass of herring is reached (not a huge number like 50 percent or 80 percent of the school, but only 15 to 20 percent who are truly committed to the new direction), the rest of the school changes direction and goes with them - almost instantaneously!*

*If you stop for a moment and consider some of the recent changes in the world, you'll see that huge swings in direction can happen very quickly. Isn't that exactly what happened in North America with respect to our attitudes toward smoking, and drinking and driving? Isn't that exactly what happened in East Germany and the Soviet Union when the communist governments lost their grip? Each of these changes were overnight successes that were years in the making that took a small group of truly committed individuals in order to make it happen. It's no different when we consider the necessary changes to our schools.*

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Email comments to the Editor

**Editors Note***: This paper is based on online discussions moderated and summarized by Dr. Brent Muirhead on 15-24 January, 2001 and summarized on 25-26 January 2001. This paper is both excellent and timely and we are pleased to have the opportunity to share this research with our readers.*

# Practical Strategies for Teaching Computer-Mediated Classes

*by Brent Muirhead*

### Introduction

*The rapid growth of computer-mediated schools has created a need for more teachers. Often, the new teachers enjoy taking on new challenges and bring a "pioneer" attitude with them. It helps to be a visionary when tackling new educational problems such as creating lectures that have substance and are interesting for students to read. A real problem is that the literature on teaching online is just developing and sometimes people are forced to speculate on particular teaching and learning problems due to the absence of research studies.*

*Yet, contemporary learners often have legitimate instructional needs and vary greatly in their academic abilities. Hannafin, Land, and Hill (1997) related concerns that most learners lack the substantial self-monitoring skills that distance education requires. They recommended that students need more academic support from their peers and teachers. Learners must be empowered through thoughtful interaction to acquire the necessary skills to effectively work in an open-ended environment. Distance education places fewer restrictions on learners (e.g. often no set time to learn), and learners must take greater responsibility for their educational experiences. Frequently, learners are under major time constraints with work and family obligations and being efficient with their graduate studies is an important issue.*

*My discussion will begin with a brief overview of several important philosophical principles that offer a foundation for the online teaching and learning process. Then, the discussion will focus on strategies and principles that will help online teachers to be creative and effective teachers.*

### Distance Education: Some Philosophical Observations on the Teacher's Role

*Teachers realize that computer-mediated education requires developing a new contemporary vision of learning. Adult educators such as Sherry (1996) affirm a new teaching and learning model that stresses student-centered instruction. Ultimately, it will demand changing the traditional role of teachers from* *information transmitters to guides who arrange meaningful learner-centered experiences (Salomon, 1992). The term education describes a teaching and learning concept that transcends just merely sharing factual information. It assumes that a capable teacher will know where he or she is going (goal-oriented). The wise teacher seeks to guide his/her students toward greater maturity, preparing them to effectively adapt to a rapidly changing world (Cantor, 1996).*

*As educators refine their philosophy of distance learning, they are concerned about sustaining interactivity in their educational process. Today's adult learning theories are built upon the premise that teachers will assist their students to become self-directed and independent. Learners must assume responsibility for their educational experiences, but independent study has natural limitations. If learners do not receive adequate teacher feedback and reinforcement, students will not always know whether they possess an accurate knowledge of their subject matter. A primary goal of adult education is to promote self-directed attitudes and behavior while discouraging excessive dependency upon the instructor (Milheim, 1993).*

*The facilitator model is based on rigorous academic standards and expectations, requiring educators who are capable of equipping students to be independent learners. Teachers are still considered knowledge experts who have a clear understanding of their subject matter. Yet, their new role involves promoting more self-directed learning activities that cultivate achieving knowledge objectives through personal study. Teachers are challenged to carefully design instructional activities that guide their students into on-line learning situations that promote personal acquisition of knowledge. Teachers strive to encourage positive learning habits that foster both self-directed learning styles and genuine collaboration with other classmates. It requires planning creative on-line instructional assignments that intellectually stretch their students but does not confuse or overwhelm them. For instance, teachers should not consider sharing a lecture transcript unless there were specific questions and class discussion that supported the reading of their lecture material. Mason and Kaye (1990) stated, "that information should be designed for a particular medium to best exploit its unique advantage" (p. 16).*

*Distance educators view computer-mediated education as an excellent format to encourage a variety of adult learning styles while serving an ethnically diverse student population. Genuine interactivity (communication, participation and feedback) should empower learners to cultivate both self-directed instructional skills and develop enriching dialog with other students. The issue of interactivity is a vital issue for teachers as they seek to create class work that promotes lively academic dialog and cultivates critical thinking skills. My interactivity research (Muirhead 1999) highlighted the fact that the quality of interactivity varies among distance education classes. A major problem involved students not receiving adequate feedback from their teachers. In fact, today's distance educators are developing a new set of terms to describe the learning problems in virtual classes. The word cyberia refers to "a place to which online students feel they have been regulated when they receive no feedback from their instructor (Jargon Monitor, 2000, p. A51)."*

### Create a Detailed Class Syllabus

*Distance educators can promote student interaction by developing a detailed syllabus for their classes. It will provide clear instructions for their online* *students while offering them a time management device to integrate schoolwork into their busy daily lives. In addition, the syllabus plays a vital role in helping students understand the teacher's expectations and establishes a foundation for positive learning experiences. Fullmer-Umari (2000) a faculty member at the University of Phoenix recommends that teachers should consider using seven key elements in their syllabus:*

1. *Course description and overview of subjects covered during the class*
2. *Teacher' biographical sketch that highlights both professional and personal experiences*
3. *Teacher contact information (e-mail addresses and telephone numbers)*
4. *Assignment schedule for each week of the course (papers, readings, etc.)*
5. *Review of university/class policies for attendance, grading, participation, late assignments, tests and specific details on academic honesty.*
6. *Request for student biographical sketches to be e-mailed to a class online newsgroup*
7. *Discuss frequently asked questions about assignments and computer problems.*

*The syllabus does help bring structure and sets the tone to the online educational setting. Adult learners appreciate having a detailed syllabus because it gives them a sense of security and enables them to direct their studies. Livengood (1987) has stressed that online classes should give the learner the opportunity to have enough control to influence the educational process. Obviously, the degree of personal control varies in every learning situation. Teachers give students instructional influence based on factors such as their knowledge of the subject matter and the type of learning assignment. Computer-mediated education is self-paced and learners are given various opportunities to create relevant and interesting work. The distance education format challenges teachers to develop a learning environment that places more responsibility on the student to accomplish academic tasks with minimal teacher assistance. Students are treated as adults who are capable of effectively learning new ideas and academic disciplines (Kasworm & Bing, 1992). It requires having teachers who design relevant lesson plans and are willing to experiment with innovative educational methods (i.e. on-line quizzes). It is an open-ended learning model that will bring some anxious moments to the best online teachers.*

**Moderating Online Discussions**

*Educators who are used to having a tightly controlled classroom might feel somewhat uncomfortable monitoring online discussion forums. The discussion format has an unpredictable dimension that makes student-centered learning dynamic but less easy to control. Teachers appreciate the lively debates that characterize most online classes. Frequently, learners offer thought-provoking dialogue because they have time to reflect on the posted comments before sharing their thoughts (Lewis, Treves, & Shaindlin, 1997).*

*Instructor-guided interaction during the course provides tutors with useful student information that can help instructors get a clear picture of learner needs. The first week of the on-line course is a good time for learners to share with their classmates and teacher their personal and professional backgrounds. Teachers can use the data to refine their learning objectives, assignments, and* *discussion forums questions to better meet adult learning needs (Rowntree, 1995).*

*Educators need to be creative in moderating online discussions because every class contains a unique set of individuals who respond differently to the operating in the online environment. For instance, how do you handle lurkers? Sometimes, writers have been somewhat critical of lurkers because of their apparent lack of involvement. In reality, lurkers are learning from the online classes just by reading online postings and communicating privately with other students. Still, it can be frustrating for distance educators to have several people who are not taking full advantage of their learning opportunities. Salmon (2000) offers superb insights from her action research studies on Computer Mediated Conferencing (CMC) at the Open University (United Kingdom). Her findings were based on a combination of content analysis of online communication of students and teachers, focused group work and testing and evaluation of a new teaching and learning model. Solmon provides seven relevant suggestions for helping teachers working with lurkers:*

1. *Give participants plenty of time to become used to the online environment before insisting that they post their responses.*
2. *Check that you have a free-flowing or social conferencing area.*
3. *Try some humor rather than anger (e.g. don't be a lurker - be a worker)*
4. *Check whether one or two individuals are dominating the conference - deal tactfully with them to create a more open and equal environment.*
5. *Provide a structured evaluation questionnaire or an area for reflections and/or comments (some lurkers prefer safety in structure).*
6. *Allocate active participants to lurkers as mentors (pp. 136-137).*

**Authentic Assessment**

*Authentic evaluation requires serious reflection that views the teaching and learning process as being dynamic and somewhat fluid. If educators are serious about promoting self-directed learning, then their assessment philosophy should reinforce the importance of giving students opportunities to influence evaluation. A comprehensive picture of evaluation must include student perceptions because they can provide insights into individual testing instruments, term papers, and online class discussions. Learner observations are valuable for gaining a good perspective on the total educational experience. Educators can use a variety of evaluation formats (formative and summative) that offer opportunities to improve the teaching and learning process. Instructors can use telephone calls and e-mail messages to individual learners as excellent ways to cultivate informal feedback that can be used to make immediate course changes. Interactivity is enhanced when teachers ask students open-ended questions that enable learners to share their perspectives about the quality of their educational experiences (Wellspring, 1999). For instance, students might have concerns about the length of discussion posting and what constitutes mastery of the subject matter (Nunn, 1998).*

*The student-centered model of learning encourages teachers to view their students as academic partners who work together to produce relevant and meaningful learning experiences. It requires professors who are willing to change their standard teaching methods. Boud (1995) related "they will need to become researchers of student perceptions, designers of multifaceted* *assessment strategies, managers of assessment processes and consultants assisting students in the interpretation of rich information about their learning" (p. 42).*

*A holistic emphasis on evaluation challenges teachers to become more flexible in their instructional plans and to consider alternative evaluation methods. Educators need to take a fresh look at instructional procedures that help them "approach non-traditional problems in nontraditional ways" (Willis, 1998, p. 58). Unfortunately, some educators are complacent about their professional growth or resist making instructional changes. Yet, teachers do have a professional responsibility to implement innovative assessment techniques into their teaching practices (Dalin, Rolff, & Kleekamp, 1993).*

*The student-centered learning model challenges teachers to carefully use descriptive language in their written and verbal comments (phone conversations) to students. Teachers must develop dialogues with their students that foster personal and professional growth. Unfortunately, some professors, through attitude and verbal and written comments, treat their students as subordinates (Hawley, 1993). Obviously, the language of assessment must be caring and honest while providing constructive feedback that helps the learner have a clear picture of their academic work.*

*Teachers are challenged by the task of evaluating on-line learner responses that are personally relevant and affirm course learning objectives. Interactivity should promote effective instructional feedback that helps learners be informed about the quality of their work (Wagner, 1994). Educators recommend that tutors offer a diversity of feedback comments that are both informational (e.g. quality of performance) and motivational for students. Educators must integrate social interaction during their class actives that affirms active participation and self-directed learning (Milheim, 1995; Wagner, 1997).*

*Distance education literature reveals that instructors are just beginning to develop new assessment procedures. The absence of formal evaluation guidelines places greater responsibility on each teacher to create their own authentic assessment instruments. Students expect personal and informative feedback on their online discussion comments and term papers (Hodges & Hodges, 1998; Kearsley, 1998).*

*In my online teaching, students have related that they appreciate having my grading rubric before doing their group projects and individual papers. The following is an example of a basic rubric:*

1. *Title Page (title of paper, complete name of student, name of course, teachers' name & date submitted) Introduction (sets up discussion for reader) & Conclusion (provides summary & closure)*
2. *Reference Page (complete bibliographic information using APA style guide & use APA format within paper)*
3. *Vary sentence length /correct spelling of terms*
4. *Demonstrates a clear focus (organization)*
5. *Demonstrates critical analysis of subject matter*
6. *Demonstrates relevance to profession*
7. *Cultivating Critical Thinking Skills*

*A major challenge to distance educators is to create assignments and online discussions that foster critical thinking skills. Contemporary educators are* *sometimes concerned that distance education is a poor substitute for the traditional classroom. Obviously, online degree programs should uphold high academic standards and one way to do this is to promote critical thinking skills.*

*Lipman (1995) relates that "... critical thinking is skillful, responsible thinking that facilitates good judgment because it (1) relies upon criteria, (2) is self-correcting, and (3) is sensitive to context" (p. 146). It is one of the best definitions on critical thinking because Lipman integrates the concepts of standards (criteria to measure achievement), skills (especially cognitive) and personal judgment (making wise choices) into a comprehensive educational package. Lipman argues for a holistic instructional approach that acknowledges the importance of both teachers and learners fulfilling their respective roles in the educational process. Teachers must consistently affirm the independence and autonomy of their learners by enabling them to freely pursue authentic learning objectives. Yet, the idea of independence does not mean being totally separate or isolated from other learners and teachers. Rather, a balanced perspective would highlight giving learners the power to assume greater responsibility for their educational experiences while actively working with the teacher and other students (Sammons, 1990). Therefore, the context of learning critical thinking skills is interactive and built upon taking individual responsibility for academic achievements. Genuine reflective thinking requires being dedicated to improving individual academic performance by continuously enhancing cognitive skills.*

*Unfortunately, the concept of critical thinking has been confused with being something quite abstract from daily living. In reality, adults utilize critical thinking skills in a host of situations: individuals raising questions about their behavior in an relationship, employees who explore the rationale behind their work assignments, managers experimenting with new forms of group work, citizens posing difficult questions to their political leaders, and families discussing the merits of various television shows (Brookfield, 1987).*

*Brookfield (1987) outlines five characteristics of critical thinking:*

1. *Critical thinking is a productive and positive activity.*
2. *Critical thinking is a process, not an outcome.*
3. *Manifestations of critical thinking vary according to the contexts in which it occurs.*
4. *Critical thinking is triggered by positive as well as negative events.*
5. *Critical thinking is emotive as well as rational (pp. 5-7).*

*The five characteristics highlight the dynamic nature of critical thinking and help people realize that life is filled with an enormous variety of opportunities to engage in thoughtful analysis and action. Ultimately, it involves a careful investigation of our personal assumptions about ourselves, our world and our relationships to one another. Critical thinkers tend to look beyond the surface of situations by exploring alternative perspectives. Yet, it is not a purely rational process because people are emotional creatures and any description of their thinking must include feelings.*

*Peirce (2000) shares eight strategies for teaching thinking in the online setting:*

1. *Design self-testing and tutorials on basic chapter content.*
2. *Apply the concepts of the textbook chapters to cases or issues every week.*

3. *Pose well-designed questions for asynchronous discussion.*
4. *Ask students to reflect on their responses to the course content and on their learning processes in private journals.*
5. *Create cognitive dissonance: provoke discomfort, unsettle confirmed notions, uncover misconceptions, inspire curiosity, pose problems.*
6. *Conduct opinion polls/surveys as pre-reading activities before assigned readings and to arouse interest in issues or topics.*
7. *Present activities that require considering opposing views.*
8. *Assign a mediatory argument promoting a resolution acceptable to both sides (p.1).*

**Conclusion**

*Today's distance educators face unique challenges that require a willingness to experiment with different teaching strategies. Our discussion on teaching strategies will involve an assortment of issues:*

1. *What is considered "reasonable" student access to online faculty members?*
2. *What criteria should be used when conducting online peer reviews of faculty teaching?*
3. *What type of instructional strategies can online teachers use to humanize the educational process?*

**References**

*Boud, D. (1995). Assessment and learning: Contradictory or complimentary? In P. Knight (Ed.), Assessment for learning in higher education (pp. 35-48). London: Kogan Page Limited.*

*Brookfield, S. D. (1987). Developing Critical thinkers: Challenging Adults to Explore Alternative Ways of Thinking and Acting. San Francisco: Jossey-Bass.*

*Cantor, J. A. (1995). Experiential learning in higher education: Linking classroom and community. (On-line), Available Internet: http://ntlf.com/html.lib/bib/bib/95-7dig.htm.*

*Dalin, P., Rolff, H., & Kleekamp,. (1993). Changing the school culture. London: Cassell.*

*Fullmer-Umari, M. (2000). Getting ready: The syllabus and other online indispensables. In K.W. White & B. H. Weight (Eds.). Online teaching guide: A handbook of attitudes, strategies, and techniques for the virtual classroom. Needham Heights, MA: Allyn & Bacon.*

*Hannafin, M. J., Hill, J. R. & Land, S. M. (1997). Student-centered learning and interactive multimedia: Status, issues, and implications. Contemporary Education, 68, 2, 94-99.*

*Hawley, P. (1993). Being bright is not enough: The unwritten rules of doctoral study. Springfield, ILL: Charles Thomas Publisher.*

*Hodges, L. & Hodges, R. (1998). On-line learning and authentic assessment. In Y. Cano, F. W. Wood, & J. C. Simmons (Eds.), Creating high functioning schools: Practice and research (pp. 185-191). Springfield, IL: Charles C. Thomas Publisher.*

*Jargon Monitor. (2000). The Chronicle of Higher Education, 57, 13, A51.*

*Kasworm, C. E. & Bing, Y. (1992). The development of adult learner autonomy and self-directedness in distance education. (Report No. CE 063 391). Springfield, VA: DYNEDRS. (ERIC Document Reproduction Service No. ED 355 453)*

*Kearsely, G. (1998). A guide to online education. (On-line). Available Internet: [http://www.fcae.nova.edu/~kearsely/online.html](http://www.fcae.nova.edu/~kearsely/online.html).*

*Lewis, D. C., Treves, J. A. & Shaindlin, A. B. (1997). Making sense of academic cyberspace: Case study of and electronic classroom. College Teaching, 45, 3, 96-100.*

*Lipman, M. (1995). Critical thinking---what can it be? In A. L. Ornstein & L. S. Behar (Eds ), Contemporary Issues in Curriculum (pp. 145-152). Boston, MA: Allyn & Bacon.*

*Livengood, M. D. (1987). Interactivity: Buzzword or instructional technique? Performance & Instruction, October, 28-29.*

*Mason, R. & Kaye, T. (1990). Toward a new paradigm for distance education. In L. M. Harasim (Ed.), Online education: Perspectives on a new environment (pp. 15-30). New York: Praeger.*

*Milheim, W. D. (1995) Interactivity and computer-based instruction. Journal of Educational Technology Systems, 24, 3, 225-233.*

*Muirhead, B. (1999). Attitudes toward interactivity in a graduate distance education program: A qualitative analysis. Parkland, FL: Dissertation.com.*

*Nunn, D. (1998). Delivering general education subjects electronically: Part One & Two. Available Internet: [http://node.on.ca/tfl/integrated/fieldnotes/nuun2.html](http://node.on.ca/tfl/integrated/fieldnotes/nuun2.html).*

*Peirce, W. (2000). Teaching thinking online: Strategies for promoting disciplinary reasoning, intellectual growth, and critical consciousness. 6th International Conference on Asychronous Learning Networks, November 3-5, Adelphia, MD. Available internet: [http://www.aln.org/alnconf2000](http://www.aln.org/alnconf2000)*

*Rowntress, D. (1995). Teaching and learning online: A correspondence education for the 21st century? British Journal of Educational Technology, 26, 3, 205-215.*

*Salmon, G. 2000. E-Moderating: The key to teaching and learning online. London: Kogan Page.*

*Salomon, P. C. 1992. The changing role of the teacher: From information transmitter to orchestrator of learning. In F. K. Oser, A. Dick, & J. Petry (Eds.). Effective and responsible teaching: The new synthesis (pp. 35-49). San Francisco, CA: Jossey-Bass.*

*Sammons, M. (1990). An epistemological justification for the role of teaching in distance education. In M C. Moore (Eds.), Contemporary issues in American distance education (pp. 151-162). New York: Pergamon Press.*

*Sherry, L. (1996). Issues in distance learning. International Journal of Educational Telecommunications, 1 (4), 337-365.*

*The Well Spring, 1999. Improving distance learning (On-line).Available*

*Internet: http://wellspring.isinj.com/.*

*Wagner, E. D. (1997). Interactivity: From agents to outcomes. New Directions for Teaching and Learning, 71, 19-26.*

*Wagner, E. D. (1994). In support of a functional definition of interaction. The American Journal of Distance Education, 8, 2, 6-29.*

*Willis, B. (1998). Effective distance education planning: Lessons learned. Educational Technology, 38, 1, 57-59.*

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Email comments to the Editor

**Editor's Note:** *This concentrated research serves as a valuable assessment tool for the ACSC Distance Learning Program. The study also serves as a valuable model for other in-depth comprehensive evaluation studies of Distance Learning programs across the board.*

# Formative Evaluation of the ACSC Distance Learning Program: A Status Study

*Donald A. MacCuish*

**Abstract**

*Reeves (1992) states that formative evaluation is the systematic collection of information for the purpose of making informed decisions about designing and improving educational programs. Gleason and Donahue (1996) elaborated on the necessity of formative evaluation by stating that educational institutions have an obligation to conduct formative evaluation of their educational programs. To date our formative evaluation of our distance learning program has been sound, but not as comprehensive as I would prefer. In this paper I discuss our most recent and most comprehensive analysis (formative evaluation) of the Air Command and Staff College (ACSC) Distance Learning (DL) Program. Our methodology in this evaluation, in my opinion, was rather unique. Essentially I looked at our program through the lens of accepted learning theory and the 'best practices' as documented in the literature.*

**Introduction**

*The Air Command and Staff College is a part of the Air University located at Maxwell AFB, AL. It is the intermediate level service school for Professional Military Education in the Air Force. Our resident student body of approximately 600 students is comprised mainly of active duty Commissioned Officers in the US Air Force. There are, however, students from the US Army, Navy, and Marine Corps as well as the Air Force Reserve, Air Guard, a limited number of civilians, and a contingent of International Officers representing 70 countries.*

*Curriculum content is determined by a number of factors, which include Congressional mandate, Joint Professional Military Education Requirements developed by the Chairman of the Joint Chiefs of Staff, needs of the Air Force, Air University's Continuum of Professional Military Education, etc. Although these factors may appear to limit curriculum content, such is not the case. ACSC has a great deal of latitude with regard to curriculum content.*

*The resident program is ten months long. Upon satisfactory completion of the program students receive a diploma and Phase I Joint PME credit. Those who maintain a 3.0 GPA are also awarded a Masters Degree in Military Operational Art and Science.*

*It is important that one have a solid understanding of the resident program curriculum because the curriculum of the distance learning program parallels it. The major difference between the two programs rests on the mode of delivery of the instruction and the intensity of the learning experience itself. Our distance learning program is much more reliant on technology than is the resident program. The distance learning program averages 8,500 students who are at varying stages of completion, thus the student to student and student to faculty interaction is less intense. We have mitigated these differences by providing our students a well-designed educational program, a good mix of media, and an aggressive approach to courseware improvement.*

**Methodology**

*As noted previously, the Distance Learning Directorate has an established evaluation program that incorporates all four levels of evaluation. Based on our analytic efforts the data indicates that the ACSC Distance Learning curriculum is sound and properly represents the resident program. The data also show that the program content is relevant to the needs of the nation, the Air Force, and our nonresident students. Furthermore, the data support the notion that both instruction and learning are more than adequate. We also know ACSC graduates of both the resident and distance learning programs make a positive impact in their duty assignments. Our conclusions have been confirmed by outside agencies (for example the Air Education and Training Command's Inspector General, CINCs, Air University Board of Visitors, paid consultants, and others).*

*Even though we are confident in our successes and the strength of our distance learning program there is room for improvement. The question is where should we focus our attention, more specifically our evaluation efforts?*

*Twenty years of experience in the design and development of training and education programs have convinced me that little is done in the area of evaluation of application of pedagogical theory and best practices. Neither training nor educational program developers consult the literature as they are designing and developing their programs. They tend to rely on experience, sixth sense, and established protocols. Thus, we tend to believe that our programs are grounded in theory and best practices derived from quality research. These two issues influenced my decision on the necessity of evaluating our performance in these two areas of our distance learning program.*

*The literature overwhelmingly supports the notion of program evaluation! Saylor and his associates, for example, state that evaluation of an entire program is very important and that the goal of such an evaluation is to place a value judgement on all the educational experiences (Saylor, et al, 1981). McNeil (1990) states that "Technologists evaluate a curriculum project by assessing (a) the merits of its goals, (b) the quality of its plans, (c) the extent to which the plans can be carried out, and (d) the value of the outcomes." Pratt (1994) like Saylor, et al and McNeil emphasized evaluation during the planning,* *design, and development of an educational program, but had little to say about evaluation of a program already in place other than does it meet expectations. In my opinion there must be a better way to evaluate a program other than to simply make an arbitrary value judgement about the program or assign a rating to each of the four McNeil criteria.*

*I wanted our evaluation effort to be quite specific with regard to what we do, how well we do it, and where we need to improve. In my opinion abstract outcomes were not going to be acceptable.*

*Since there did not seem to be a literature base in the area of program evaluation to assist me in this effort I turned my attention to the types of research that might guide this research effort. Several types of research, for example (experimental, ethnographic, and historical) were immediately dismissed because they, obviously, were not appropriate. My consultation of Best and Kahn (1998) led me to the conclusion that the type of effort was descriptive, but the subcategories of descriptive research they identified did not seem particularly oriented to what I wanted to accomplish. I also consulted Wiersma (1995) and Ary, Jacobs, and Razavieh (1996) in hopes that these authorities would be able to guide me in this effort. I finally consulted Hopkins and Antes (1990) who provided me with some guidance. Under their section on descriptive research they discussed what they called "The Status Study." In the status study the researcher reports on the current conditions. This report is then used to make administrative decisions concerning the specific program being investigated. This methodology suited my needs. Thus, I had finally been able to identify a research methodology suitable for evaluation of a complete educational program.*

*I looked at our program from two perspectives. First was from the theoretical perspective. Are we following good pedagogical theory? If our program is not grounded in theory, then why not? If this is the case what corrections must we make? If our program is grounded in theory, do we know what theory we have adopted, why we have adopted it, and are they the most appropriate theories to use? The other perspective is what I call best practices. I wanted to know whether or not we were appropriately matching best practice to the situation or the circumstances. I do not believe you can have an effective educational program if pedagogy and practice are not synchronized.*

*Admittedly, what I have included in this paper is not comprehensive, but rather representative of the findings rendered as part of this project. I have included both good and bad findings in this article so it can be a valuable reference for the reader.*

### Theories

*Theories and models are not simple academic abstractions designed to cloud the unknown, rather they are thoughtful philosophical or empirical ways to explain events, which are thought to occur or in fact do occur. Models are one method we use to illustrate the execution of a theory. I have chosen to begin my formative evaluation of the ACSC distance learning program by addressing curriculum development.*

**Curriculum Development** - *In 1986 this researcher investigated the curriculum development process at the four war colleges (MacCuish, 1986a). In this study I reminded the reader that "Curriculum construction in the United*

*States is generally conducted in a shockingly piece meal fashion (Zais, 1976)." I mentioned this as one of my reasons for undertaking the study of the curriculum development process at the four War Colleges. I used four models (academic, experimental, technical, and pragmatic) described by Gay (1980) as a basis for my investigation of the curriculum development process at the war colleges. I was able to determine that the Zais statement noted above did not apply to any of the War Colleges.*

*Since the ACSC DL curriculum parallels that of the resident program, I thought it imperative to determine how the curriculum of the resident program was developed. It was critical that I not make assumptions concerning development of the curriculum. I referred, naturally, to my prior curriculum development study of the four War Colleges. I am convinced the curriculum development processes used by both the Air War College and ACSC are based the academic model for the 'academic' content areas and the technical model for the areas considered as 'operational'.*

*Although this may seem odd, it is not. Rather, it is quite appropriate. The ACSC distance learning program, like the resident program is rooted in a two-semester system. The first semester's courses are academic in nature (National and International Security Studies, Nature of War, and Air Power Studies). Thus developing this portion of the curriculum using Gay's Academic Model makes a great deal of sense. Using the "academic subjects" of the first semester as a knowledge base, the second semester courses (Aerospace Operations, Joint Forces, Campaign Planning, and the culminating Air Force Exercise) are technical courses on the application of aerospace power. Here the Technical Model drove the curriculum development process. Of particular interest is the Leadership and Command Course, which is divided into three phases. It shows the influences of both the academic and technical models.*

*Thus, the ACSC curriculum development process is grounded in theory. The two theoretical models ACSC has chosen to use are appropriate for the institution and the learning outcomes required by the nation. Bruner (1977) best articulates another reason these two models are appropriate to the ACSC curriculum. The ACSC curriculum provides the structural elements described by Bruner in his classic work The Process of Education. ACSC has developed a "spiral curriculum" designed to educate the professional Air Force Officer with the knowledge and skills necessary to implement the National Security Strategy of the United States. This is significant because the graduate of the ACSC distance learning program has the ability to integrate the military instrument of power with the other three national instruments of power (diplomatic, economic, and informational).*

**Course Design**

*American Psychology is dominated by behaviorism. Because of this dominance the underlying principles of behaviorist thought predominates the field of training and to a lesser degree education. There are a number of practitioners who do not care to acknowledge that there is a difference between training and education. Woodington (Saylor, et al, 1981, p. 361) for example states that the intent of training is to enable people to gain new knowledge and skills in order to do their jobs, improve job performance, and develop specific competencies. Education, however, is "the acquisition of the* *art of the utilization on knowledge (Saylor, et al, 1981, p. 140). Schreiber and Berge (1998, p. 179) assert that training "responds to organizational processes and job functions," while education "aims at enriching and expanding the role of an individual within a profession or society." Dipboye and his associates (1994) state that the purpose of training is to better the performance of the organization by improving the job skills of its personnel. Schreiber and Berge (1998, p. 414) also make the distinction between education and training noting that the focus of training is performance outcomes, while education is much broader in scope, specifically the acquisition of knowledge and how to apply that knowledge in novel ways.*

*I think these few references adequately sustain my position that there is, at the minimum, a philosophical distinction between education and training. This distinction, I suggest is so profound that it affects the basic assumptions made by the instructional developer and thence the philosophical approach taken by the instructor in designing the course as well as the instructional practices that will be utilized. The importance of this distinction continues to manifest itself in the ACSC distance learning program. The failure of the Air Force to recognize and appreciate the implications of the subtle distinctions between education and training is the major deficiency identified in this evaluation effort.*

*There are a number of learning theories, all of which can be grouped into categories or families. For example, Hilgard and Bower identify eleven different categories, while McDonald identifies six, and Gage three (Knowles, et al, 1998, p. 20 and 21). Kearsley (2000) provides an in-depth description of 50 learning theories on his web site. Knowles, et al (1998, p. 22) try to simplify things for us by stating that "learning theories fall into two major families: behaviorist/connectionist theories and cognitive/gestalt theories, but not all theories belong to these two families." The theories that are easily placed in the two major families are, obviously, the most widely used. Herein is the problem at ACSC.*

*Several hundred thousand military and civilian personnel are enrolled in the education and training programs offered by the Air Force each year. The overwhelming majority of this student population is enrolled in programs designed to develop and enhance job performance skills, e.g. training programs. A learning theory from the behavioral/connectionist theory family is most appropriate if we intend to reach the desired learning outcomes of Air Force training programs. The model the Air Force has selected is the Instructional Systems Design (ISD) Model (a.k.a. The Systems Approach to Training), whose roots are most commonly associated with such prominent dignitaries as Briggs, Cary, Deterline, Dick, Gagne, Merrill, and others.*

*Air Force Manual (AFMAN) 36-2234 (1979) describes the Instructional Systems Design process that is to be used for the development of all educational and training programs in the Air Force. AFMAN 36-2236 (1994) is the official Air Force instructor's guide for the development of all instruction whether it be for education or training. The problem with both of these publications is that they mandate a behavioral approach to both education and training. I agree that behaviorism should be the foundation upon which training programs are built primarily because this approach targets objective and observable measures (Matlin, 1994). I can not agree that a behavioral approach to education is correct primarily because behaviorism rejects "any terms referring to mental events, such as image, idea, or thought (Matlin, 1994, p. 5)." Additionally, Gagne (1985) emphatically states that your theory of* *instruction must be appropriate for the desired learning outcomes.*

*Furthermore, I agree that the ISD process can be used as an instructional development umbrella for both training and education. Historically, this has lead to at least two major problems with regard to PME. First, training is process oriented, which usually means one correct solution that is reached in an orderly and sequential fashion. Usually there are many 'correct' solutions to education problems. Thus, the ISD process, if rigidly employed, limits the innovative application of knowledge. If the process is not used in this manner, but only as a skeleton upon which we drape 'educational' models, processes, etc. then we ignore the elements of the model that are it strengths. As a result we create problems for our students as described in my second objection.*

*Second, since the Air Force is a technical service, training is very important. By the time Air Force Officers qualify for enrollment in the ACSC program they have already completed one or more training program, and most have served as a trainer in at least one previous assignment. Thus, when they enroll in the ACSC DL program they tend to gravitate to a training mentality looking for processes, procedures, sequencing, and school solutions rather than the acquisition, assimilation, and application of knowledge in a fluid operational environment because they recognize the ISD features of the DL program. It is for these two reasons that I am a strong advocate for the adoption of a different model for PME institutions.*

*I suggest that the ACSC Distance Learning directorate adopt a more traditional, cognitive model, for developing instruction rather than continuing to misuse the ISD Model as an umbrella upon which we drape our educational program. My position is supported by the fact that a number of our instructional development assumptions are based on cognitive learning theories, specifically those of Argyris (1976), Ausubel (1978), Bruner (1977), DeBono (1971), Festinger (1957), Knowles (Knowles, et al, 1998), Piaget (adapted for adult learning situations, MacCuish, 1986b), and Spiro, et al (1988) among others.*

*Our educational philosophy and thus many of the learning strategies we incorporated into our program are based on adult learning (Knowles, et al, 1998; Kearsley, 2000). The sequencing of instruction is rooted in theory. For example Bruner's Constructivist Theory provides a general framework for the sequencing of instruction based on cognition, the "spiral curriculum" (Bruner, 1977 and Kearsley, 2000). The notion of learning based on the development of cognitive structures, most commonly referred to as schemata is well established and documented in Piaget's Genetic Epistemology (Piaget, 1977; Wadsworth 1972; MacCuish 1986b; Gruber & Voneche, 1977; Kearsley, 2000).*

*Ausubel's Subsumption Theory shares conceptual frameworks with Bruner, Piaget and Spiro, et al. This theory is appropriately used in the ACSC distance learning program. Two aspects of his theory are significant. First, he notes that it is oriented to individuals learning vast amounts of material from verbal (video) and textual materials (Kearsley, 2000). All of our learning materials are relevant to the educational outcomes. Additionally, we continually review these materials for relevancy, substance, and currency. Second, Ausubel stresses the importance of "advanced organizers." Advanced organizers help to explain, integrate, and show the interrelationship of the learning materials prior to presenting the actual learning material.*

*These are more than lesson overviews and summaries (Ausubel, 1978; and Ausubel, et al, 1978). We incorporate advanced organizers in a number of ways, for example course and lesson thesis statements, lesson materials rationale, lesson introductions (video), OPMEP requirements, etc.*

*In our Leadership and Command Course, for example, we have incorporated a specific learning theory to help us improve the desired cognitive outcomes of each phase in the course. Double Loop Learning is a theory of action and is quite appropriate in helping people learn to change their values and assumptions (Kearsley, 2000 and Hughes, et al, 1999). The notion of double loop learning not only helps guide us in the development of our course materials and learning experiences, but also helps students better understand how to take charge of their own learning with regard to values and assumptions. Once students understand this approach, we integrate it into the "Mentoring" Module of this course and encourage them to adopt this approach when mentoring subordinates.*

*We also use the principles of Festinger's Cognitive Dissonance Theory in the Leadership and Command Course. If people are truly going to change their beliefs, opinions, and values then we must create 'cognitive dissonance' (Kearsley, 2000). Whenever people talk about values, they want to know whose values are we going to teach. Our goal is not to impose out values, but to challenge them with the idea that the Core Values of the Air Force (Integrity first, Service before self, and Excellence in all that we do) are really universal. We accomplish this task by challenging basic assumptions. We provide documentation to the students that highly respected researchers have proven that there is a universal set of values that transcends all cultures, religions and ethnic groups (Kidder, pp. 90 and 91, 1995). We then show that the three Core Values of the Air Force summarize these. It also helps us illustrate that all members of the Air Force share these values.*

*Spiro, et al (1988) articulated a theory of Cognitive Flexibility. This theory emphasizes the ability to spontaneously restructure one's knowledge in response to rapidly changing situations (Kearsley, 2000). DeBono in his theory of Lateral Thinking addresses issues associated with the generation of novel solutions to problems (Kearsley, 2000). Both of these theories are relevant to today's Air Force officer in the employment of aerospace power in support of the National Military Strategy of the United States. The principles of these two theories link our instructional practices. The proof of our success is only realized in the successful conduct of air operations. The failure of our efforts will be seen in the deaths of American, allied, and coalition military personnel. In a worst case scenario it will be depicted in a catastrophic military defeat on the battlefield.*

## Best Practices

*Reeves (2000) reiterated a comment made by Cronbach in 1975 about empirical research. The essence of this comment is that "empirical research is doomed to failure because we simply cannot pile up generalizations fast enough to adapt our instructional treatments to the myriad of variables inherent in any given instance of instruction" (Reeves, 2000, p 5). When we consider trying to apply empirical research to technology based learning situations the reality of this comment is even more profound. Thus, we chose to evaluate our practices by studying what other practitioners have written and compared* *what we actually do to many of the suggestions made. We evaluated our practices against some of these suggestions, but not all. When we did not use a suggestion our decision not do to so was a conscious one. Our goal was to determine whether or not there is agreement with what we do.*

*I began the evaluation of our 'Best Practices' by consulting Vincent Flanders' web page ([http://www.webpagesthatsuck.com](http://www.webpagesthatsuck.com)). I found his comments and critiques to be quite useful. Since the ACSC course materials are distributed both by CD-ROM and via the ACSC DL website, we thought it wise to enable students to transition from one media to the other as transparently as possible. To accomplish this task we had to ensure that the organization of materials in the website and on the CD-ROM were similar. When we compared our approach to the Flanders guidelines contained in his publication Web Pages that Suck (Flanders, 1998) we found our structure was 'right-on.' For example, Flanders (1998) emphasizes the importance of a well-structured web site that facilitates navigation, is aesthetic, and minimizes the likelihood that students will get lost in cyberspace. Our technical staff, after reading and studying the literature, incorporated sight identifiers on every web page to assist students in navigation and minimize the likelihood of becoming lost. Golas (2000) in her comments on navigation included the ease with which a student can return to the starting point and a lack of deadends.*

*In my research I also found that our approach is considered good practice by DeBra (1996) who emphasized the importance of a clear and systematic organization of the learning site and Smith, et al. (1997) who contend that instructional content should be modular. Modularization provides two distinct benefits to us as an organization. First, it facilitates student navigation and reduces the likelihood of their getting lost in cyberspace, which was one of the concerns voiced by Flanders. Second, when we have to update or revise our course materials it is easier and more efficient to pullout the old module and plug in the new one than to revise the whole course. This approach is a matter of sound instructional practices and technological flexibility.*

*Although Schneiderman (1998) indicated that the depth of menus could go to 4 or 5 levels, we purposefully limited our depth to two and in rare instances three levels. We thought that going to four levels was both unnecessary and could lead to student boredom just like answering services do after the third level.*

*In another instance where our approach varied from one recommended by another practitioner is use of color. Reemers (1998) recommends that you use no more than four colors per web page. We determined that if our screen design was done well and we did not use color for the sake of having color, then we could exceed the four-color limitation. Student feedback validates our decision.*

*Several other researchers provided insights about interface design guidelines that also helped us formatively evaluate the ACSC DL program as well. Florida Gulf Coast University (2000) hosts its recommendations for the design of online instruction on the university's website. We already follow many of the principles suggested in the FGCU recommendations. We further compared our practices to those articulated by Orr, et al (1993) and Golas (2000). Since our CD-ROM and online practices are in harmony with so many published recommendations we are very confident in our organization of the website as well as the CD-ROM.*

*Also of concern to us is the presentation of distance learning materials. For example, Beltran (1996) recommended that the line length of text should not exceed 60 characters and should be in standard font sizes. With the exception of the readings, which were intended to be printed and not read on a monitor, we adhere to Beltran's principles as well.*

*Our use of both CD-ROM and the website as storage areas for our readings presented us with some additional concerns. Interestingly, several of our resident students evaluated Interactive Multimedia as an instructional tool in 1995 (Wilson, et al, 1995). They empirically verified many issues related to screen design, text fonts, and standardization of lesson formats. They noted that serif faces although not flashy or "full of character" cue the reader to quickly identify letters in a word. They also verified that such fonts are more legible and each letter is more distinguishable than other faces. As a matter of Air Force policy we are required to use serif faces so that was not an issue, unlike my earlier comments about our having to use the ISD process. Last year we initiated a lesson standardization policy. This intuitively made a great deal of sense.*

*Previous to the 'standing-up' of the current Distance Learning Directorate this type of standardization was impractical. Each of the three teaching departments had responsibility for both the resident and distance learning courses within their domain. Each department had different standards, policies and methods. As a result within each department resident and distance learning materials were standardized, but this same standardization did not exist across the distance learning program. We believe many of our students would have been spared a great deal of confusion, which they articulated in their feedback forms, had the reorganization occurred earlier than it did.*

*As a direct result of reading the Golas and Wilson papers, I began to search for what others had written. Nielson (1997) verified the wisdom of our decision and confirmed what Golas and Wilson, et al had written. Feedback from our students supports our decision.*

*In the mid 1990s, when the ACSC DL Course Materials were first moved from printed matter to CD-ROM/Web-based materials someone overlooked the strength and weaknesses of CD-ROM and the World Wide Web as instructional media. Except for a few Asymmetric Toolbooks these two media served as simple storage systems for the readings. It did not take long for ACSC to recognize this mistake. Our mistake in this situation reminded us that different types of knowledge, course content, etc. require different forms of media (Gagne, 1985; Merrill, 1991; Merrill, et al., 1997, Merrill, 2000). We have not forgotten this expensive lesson.*

*As mentioned earlier, ACSC instituted its current organizational structure in January 1999. Those of us who were instrumental in this reorganization effort quickly analyzed the presentation of course materials. Prior to January 1999, the ACSC Distance Learning Program was limited to readings and Asymetrix ToolBook multimedia presentations. Student feedback confirmed our initial reaction. Since that time we have made significant improvements to our program. The readings are fundamental to the education of midcareer officers, so our effort in this area was to eliminate redundant readings thereby making the reading more manageable. We also rewrote the ToolBook exercises into html format. Unfortunately, we have not found anything in the* *literature concerning these two items, so our evaluation is limited to student feedback, which does validate our approach.*

*Also in our preliminary evaluation of the distance learning program was concern about student knowledge. We felt that readings and multimedia exercises were insufficient. So we introduced synchronized multimedia using RealPlayer tools in the fall of 1999. Golas (2000) stresses the benefits of this type of multimedia presentation. The combination of student feedback and her comments are strong endorsements of our having implemented synchronized multimedia learning events.*

*This evaluation of the ACSC DL Program confirmed our greatest concern, student assessment. At the present time we are limited to proctored multiple choice tests given at the Base Education Office. This limitation is due to a number of factors that are, until now, difficult to overcome. Our preference is to move to either an essay format or a scenario-based format or a combination of the two. At this level, our objective is to not assess a student's knowledge, but his or her ability to organized, analyze, and present a solution to an abstract problem in a coherent manner. Thus, multiple-choice items are not good indicators of student knowledge. Students have also voiced their concerns in this matter because they recognize that the multiple-choice format does not prepare them to organize, analyze, and present a solution in a military staff environment.*

*To overcome this deficiency we are looking at two options. The first is evaluation of a computer-enhanced assessment of essay materials. This assessment format, although completely automated, promises to correct many of the limitations of essay examinations. If proven successful, then we will be able to not only add a writing component to our distance learning program, but also have students recommend a course of action to their commander in the form of a staff study. This means that we will not only assess student knowledge, but provide the student with a learning experience as well.*

*The other possibility is to construct an ongoing student assessment that ties each of the eight courses in the program together. The key factor will be a computer-based scenario that requires student input at several times in each course. This approach would be analogous to a war game. War games have proven themselves as invaluable learning and assessment tools.*

**Conclusion**

*This paper describes a formative evaluation of the Air Command and Staff College's Distance Learning Program. What separates this evaluation apart from others found in the literature is its comprehensiveness. In addition to student feedback, which admittedly is important to us, we evaluated every aspect of our distance learning program. We have evaluation documentation showing that the ACSC curriculum is well thought out and balanced. We have verified that it serves the needs of the US Air Force. We have determined that the approach to instruction and the learning activities we have incorporated are grounded in theory.*

*We carefully analyzed our educational practices. Although they made sense to us, we wanted to determine whether or not our approaches were in agreement with those of other practitioners. If they were, we wanted to know which ones. If they were not, then we wanted to know why not. Perhaps we* *are innovative. Perhaps we had not thought of the methods used by someone else. Perhaps we simply chose not to use those methods or perhaps the methods being used were not appropriate to our situation.*

*Our results in this regard were mixed. In some instances we are 'right on' with what others are doing. In some situations we are 'leading-the-pack'. In others, we were simply wrong in our approach and the approach other practitioners have adopted have helped us improve our program. And, in some instances their ways are not our ways and appropriately so.*

*Perhaps the most important outcome of this evaluation, in this author's opinion, is the realization that the method or process we currently use to design and develop the lessons and course materials in the distance learning program represents a disservice to our students. The reason for this is our students recognize the artifacts of the ISD Model and these overshadow the desired learning outcomes of the educational program.*

*The US Air Force, as do the other military services, requires the use of the Instructional Systems Design (ISD) or some variant thereof, for both education and training. The ISD Model for instructional development is based on behaviorism and is quite appropriate for training or courses that require students to be 'able to do' something (Golas, 2000). At the Air Command and Staff College we are concerned with the 'knowledge' that the student 'needs to know.' We educate our students so each one can lead in developing, advancing, and applying aerospace power across the spectrum of service, joint, and combined military operations. In my opinion, therefore, a cognitive model, not one rooted in behaviorism, is more appropriate especially when you consider the fact that we do not, in reality, adhere to the basic precepts of the model.*

*This comprehensive evaluation of the ACSC Distance Learning Program should be helpful too not only our sister service schools, but to colleges and universities that have distance learning programs too. Without a complete analysis of your educational program how can you honestly and accurately determine its strengths and weaknesses? A comprehensive evaluation process ought to include curriculum development, design of the instruction, learning theory, and best practices. I suggest that most institutions severely limit the evaluation of their distance learning program to the technology used, comparison of the grades received by resident/distance learning students, student impressions of learning at a distance, and a few other factors. I think we ought to do better than that.*

**References**

*Argyris, C (1976). Increasing Leadership Effectiveness. New York: Wiley*

*Ary, D., Jacobs, L.C., and Razavieh, A. (1996). Introduction to Research in Education, 5th ed. Fort Worth: Harcourt Brace College Publishers.*

*Ausubel, D. (1978). "In defense of advanced organizers: A reply to critics," Review of Educational Research. 48, pp 251-257.*

*Ausubel, D., Novak, J. and Hanesian, H. (1978). Educational Psychology: A Cognitive View. 2nd ed. New York: Holt, Rinehart and Winston.*

*Best, J.W. and Kahn, J.V. (1998). Research in Education. 8th ed. Boston:*

*Allyn and Bacon.*

*Bruner, J. (1977). The Process of Education. Cambridge, MA: Harvard University Press.*

*DeBono, E. (1971). Lateral Thinking for Management. New York: McGraw-Hill.*

*DeBra, P.M. (1996) Hypermedia structures and systems. Web course, Eidenhoven University of Technology. http://www.win.tue.nl/2L670/static .*

*Department of the Air Force (1994). "Guidebook for Air Force Instructors," AFMAN 36-2236. Washington: US Government Printing Office.*

*Department of the Air Force (1979). "Instructional Systems Development," AFMAN 36-2234. Washington: US Government Printing Office.*

*Dipboye, R.L., Smith, C.S. and Howell, W.C. (1994). Understanding Industrial and Organizational Psychology: An Integral Approach. Fort Worth: Harcourt Brace College Publishers.*

*Festinger, L. (1957). A Theory of Cognitive Dissonance. Stanford, CA: Stanford University Press.*

*Flanders, V. (2001). Web Pages That Suck. http://www.webpagesthatsuck.com (Downloaded on 25 January 2001).*

*Florida Gulf Coast University, Design Principles for Online Instruction, http://www.fgcu.edu/onlinedesign (Downloaded on 27 March 2000).*

*Gagne, R.M. (1985). The Conditions of Learning and Theory of Instruction, 4th ed. New York: Holt, Rinehart and Winston.*

*Gay, G. (1980). "Conceptual Models of the Curriculum-Planning Process." Considered Action in Curriculum Improvement. Alexandria, VA: American Society for Curriculum Development.*

*Gleason, S.C. and Donahue, N. (1996). "Boston revisits schools based management," Educational Leadership, 53, pp. 24-28.*

*Golas, K. (2000). "Guidelines for Designing Online Learning," Interservice/Industry Training, Simulation and Education Conference Proceedings. Washington: National Training Systems Association.*

*Gruber, H.J. and Voneche, J.J. (1977). The Essential Piaget. New York: Basic Books, Inc.*

*Hopkins, C.D. and Antes, R.L. (1990). Educational Research: A Structure for Inquiry. 3rd ed. Itasca, IL: F.E. Peacock Publishers, Inc.*

*Hughes, R.L., Ginnett, R.C. and Curphy, G.J. (1999). Leadership: Enhancing the Lessons of Experience. Boston: Irwin McGraw-Hill.*

*Kearsley, G. (2000). Explorations in Learning and Instruction: The Theory into Practice Database. http://www.gwu.edu/%7Etip/ (downloaded on 11 December 2000).*

*Kidder, R.M. (1995). How Good People Make Tough Choices. New York: Fireside Books.*

*Knowles, M.S., Holton III, E.F. and Swanson, R.A. (1998). The Adult Learner. Houston: Gulf Publishing Company.*

*MacCuish, D.A. (1986a). "An Investigation of the Curriculum Development Process at the Four War Colleges." Orlando: Online Computer Systems, Inc.*

*MacCuish, D.A. (1986b). "Let's talk theory: Piaget and the videodisk," Proceedings Society for Applied Learning Technology, Spring Conference. Warranton, VA: Society of Applied Learning Technology.*

*Matlin, M.W. (1994). Cognition, 3rd ed. Fort Worth: Harcourt Brace Publishers*

*McNeil, J.D. (1990). Curriculum: A Comprehensive Introduction. 4th ed. New York: HarperCollins Publishers.*

*Merrill, M.D. (1991). "Constructivism and Instructional Design," Educational Technology, May, pp. 45-53.*

*Merrill M.D. (2000). Components of Instruction: Toward a Theoretical Tool for Instructional Design. http://www.netg.com/research/merrillwp.htm (downloaded on 8 December 2000).*

*Merrill, M.D., Drake, L.D., Lacy, M.J., Pratt, J.A., and the ID2 Research Group (1996). "Reclaiming Instructional Design," Educational Technology, vol. 36, no. 5, pp. 5-7.*

*Nielsen, J. (1997). "Interface design for Sun's WWW site." http://www.useit.com/alertbox/9711a.html (Downloaded on XXX).*

*Orr, K.L., Golas, K.C. & Yao, K. (1993). "Storyboard Development for Interactive Multimedia Training," Interservice/Industry Training, Simulation and Education Conference Proceedings. Washington: National Training Systems Association.*

*Piaget, J. (1977). The Development of Thought Equilibration of Cognitive Structures. New York: Viking Press.*

*Pratt, D. (1994). Curriculum Planning: A Handbook for Professionals. Fort Worth: Harcourt Brace College Publishers.*

*Reeves, T.C. (1992). "Evaluating schools infused with technology, Education and Urban Society, 24, pp. 519-535.*

*Remmers, E. (1998). "Guideleines for WWW-based Support Environments for Education Professionals." http://users.edte.utwente.nl/remmerse/litstudy (Downloaded on XXX).*

*Saylor, J.G., Alexander, W.M., and Lewis, A.J. (1981). Curriculum Planning for Better Teaching and Learning. 4th ed. New York: Holt, Rinehart and Winston.*

*Schreiber, D.A. & Berge, Z.L. eds. (1998). Distance Training: How innovative organizations are using technology to maximize learning and meet business objectives. San Francisco: Jossey-Bass Publishers.*

*Schneiderman, B. (1998). Designing the User interface: Strategies for Effective Human-computer Interaction, 3rd ed. Reading, MA: Addison-Wesley Publishing.*

*Smith, P.A., Newman, I.A. & Parks, L.M. (1997). "Virtual hierarchies and virtual networks: Some lessons from hypermedia usability research applied to the World Wide Web. Journal of Human-Computer Studies, 47, 67-95.*

*Spiro, R.J., Coulson, R.L., Feltovich. P.J., & Anderson, D. (1988). "Cognitive flexibility theory: Advanced knowledge acquisition in ill-structured domains," Proceedings of the 10th Annual Conference of the Cognitive Science Society. Hillsdale, NJ: Erlbaum.*

*Wadsworth, B.J. (1972). Piaget's Theory of Cognitive Development. New York: David McKay Company, Inc.*

*Wiersma, W. (1995). Research Methods in Education: An Introduction. 6th ed. Boston: Allyn and Bacon.*

*Wilson, W., Abosabaah, F., Alyoshin, A., Brand, G., Creighton, K., Md Dom, Z.B., Kostik, G., LaPointe, P., & Murray, J. (1995). Multimedia: Providing Future Leaders with an Innovative Method of Instruction. (unpublished research project), Maxwell AFB, AL: Air Command and Staff College.*

*Zais, R.S. (1976). Curriculum: Principles and Foundations. New York: Thomas Crowell Company.*

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# Decision Making in the Development of Web-Based Instruction

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**Abstract**

*Advances in instructional technology are changing both the way education is delivered by faculty and received by students. One such advance has been the use of the Internet's World Wide Web (otherwise known as the Web). Web-based instruction (WBI) is a form of distance education using electronic representations of print or video to instruct. The instructor and student can be engaged in either synchronous communication (a time when both instructor and student are concurrently involved in teaching and learning) or asynchronous (both teacher and student are not involved in teaching or learning at the same time) (Moore, Cookson, & Donaldson, 1990 in Khan, 1997). Technologies dedicated to WBI have increasingly attracted the attention of educators, but while the Web presents intriguing and seemingly endless possibilities for instruction, educators must address a number of questions before deciding to deliver WBI.*

*A potential set of questions have been identified and placed into a decision making model for use of WBI. The first set of questions concerns motivation: First, why do we want to engage in WBI? Second, what are our reasons for investigating WBI? The second set relates to content and pedagogy: What is the subject matter to be delivered through the Web? What style of instruction will be used in the content development and delivery? The third set of questions involves the target audience: Who is the intended target audience of the WBI? What are the characteristics of successful online students? The fourth set involves timelines: When is the course to be delivered over the Web? What timelines are dictating the development, completion, maintenance, and evaluation of the course? The fifth set of questions addresses resources needed: What resources are available to develop, deliver, maintain, and evaluate the course? The need to ask these important questions is discussed in the following paper along with research supporting the implications of such*

*an inquiry.*

**Decision Making in the Development of Web-Based Instruction**

*Distance education (DE) is transforming higher education pedagogy at an increasing rate. There are many reasons for this rapid increase including student considerations, cost effectiveness and advances in technology. Additionally, there is a great need for alternate methods of instruction for the adult learner who is in need of a degree, certification, or continuing education credits. Using the traditional method of instruction many students must fit coursework within constraints of family and part-time work (Bertram, 1999). Technology is changing the way education is delivered by faculty and received by students. One such advance has been the use of the Internet  s Web to deliver coursework. The accessibility of Web-based instruction (WBI) is increasingly finding consumers, including faculty, interested in furnishing educational opportunities through the Internet.*

*As defined by Khan (1997), WBI is "a hypermedia-based instructional program which utilizes the attributes and resources of the World Wide Web to create a meaningful learning environment where learning is fostered and supported" (p. 6). The availability of Web-based courses makes higher education attainable. This includes meeting the potential educational needs of special groups such as single mothers, persons with disabilities, individuals that work multiple jobs, etc. (Bertram, 1999).*

*There are many components and features inherent to WBI, including: interactivity; multimedia capabilities; independence from device, distance, and design; global accessibility; online resources and support; learner control; convenience; ease of use; cost-effectiveness; non-discriminatory application; and collaborative learning (Khan, 1997). While many of these features may be attractive to educators, the vast array of capabilities associated with WBI creates the need for consideration of a number of factors prior to the implementation of WBI.*

*Various formats for WBI are available for instructors to use when creating courses. WBI formats generally are divided into in three categories (Hall, 1997). The first category incorporates text and graphics. This approach requires the use of hypertext markup language (HTML). HTML is the text-based language used to create Web pages and hypermedia, linking text and images to additional information (i.e. syllabi and readings). The second category of WBI incorporates interactivity, in which Web-based training engages the learner in simulation and provides the learner with immediate results of actions (i.e. pre-tests, post-tests, and exercises). Interactive multimedia is the third category of WBI. Multimodal interactivity, including audio and video, are key features within the interactive multimedia category. The interactive multimedia format is becoming more of the standard than ever before because of improved transfer speeds, available storage space, and ease of revision and updating*

*However, when designing WBI, a needs assessment should be conducted. This needs assessment should be based on learner needs such as experience with the topic, technology, and reason for taking the course (Berdine et al., in press). It appears, however, that consideration of student needs is not often in the forefront of decision making when using WBI (Barnard, 1997; Young, 1997). Barnard, (1997) and Young, (1997) suggest that market forces,* *technological innovation and tightened budgets cause many learner issues to be only secondary consideration, at best.*

*While the Web presents intriguing and seemingly endless possibilities for instruction, various considerations should be addressed before any conclusions can be drawn or a decision made as to whether or not to go with the Web for instructional purposes. The authors present several sets of questions found, both from the literature and experience, relevant to making the aforementioned WBI decision. The first set of questions deals with the considerations before using WBI. The second set involves questions on content and pedagogy; the third, considers the target audience; the fourth, addresses timelines; and the last set of questions addresses the resources needed.*

**Decision Set One - Rationale for WBI**

*The first set of questions deals with the reason for pursuing WBI. Why use WBI to deliver course work? What are the advantages -- and the disadvantages?*

*Rudenstine (1997) identifies four characteristics of the Internet that make it a suitable match for learning. The Internet offers (a) access to potentially unlimited sources, (b) opportunities to develop extensive course content, (c) informal learning processes, and (d) reinforcement of the student's active construction of knowledge (Rudenstine, 1997). Potential benefits of using the Internet include increased enrollment income through the ability to attract students at a distance. Additionally, since students are typically no longer occupying classrooms and university computer systems, there could be a reduced need for infrastructure in equipment and physical plant (Berdine et al., in press; Brooks, 1997).*

*The Web will be used as a means for delivering instruction despite the absence of a solid research base supporting its effectiveness. The Web is driving the way we live as we evolve into a digital economy, it is trendy, and our perception is that the Web is an effective means of meeting needs (Courier Journal Article, 2000). Online learning outcomes such as program completion, skill acquisition, and student satisfaction have been shown in some instances to be equal or superior to face-to-face (F2F) classroom instruction (Hiltz, 1988, 1994; Wells, 1990). However, while both WBI and traditional instruction are effective educational pedagogues, like all instructional methods, they possess both advantages and disadvantages.*

**Advantages**

*There are many advantages to using the Internet to deliver WBI (Barnard, 1997; Kirby, 1997b; Starr, 1997). Kirby (1997b) considers the ease of delivering content, the ease of modifying content, linking capabilities, and the decreased need technical support to be primary advantages of WBI. Ease of delivery, according to Kirby, is important due to the increasing number of students that have computers, allowing students to access the content and information being offered nearly anytime and anywhere. Concurrently, the content that is being offered can be modified easily by simply rewording or changing the Web connection. Additionally, the ability to link to many sources across a multitude of States and Countries allows for content to be easily accessed and disseminated. Barnard (1997) concurred with Kirby (1997b) regarding the linking aspects of WBI, but suggests that Web-based education* *prohibits individual students from dominating conversation, potentially drawing out intimidated students who ordinarily choose not to speak up in class. Another advantage that Barnard points out is the issue of anytime and anywhere access to instruction, limiting needs for travel (i.e. a student can sit at the computer in their home or at a local library and take courses at a university in another state or country). Barnard, (1997) considers this a paradigm shift eliciting on-demand learning, 24 hours a day.*

*Starr, (1997) has also attributed advantages to WBI. The aspects that Starr (1997) sees as useful include the ability to expand content, seamless integration-true interactivity and the delivery of multimedia. WBI is a very fluid environment. Content can be added to or substituted for with limited effort. New issues or research can be provided or linked into the content. Interactivity is important to enable feedback and support for students. Because the WBI instruction affords both asynchronous and synchronous interchanges many different aspects of instruction may be accomplished. Finally, Starr indicated that various forms of information could be presented via multiple methods that are not so easily utilized in other pedagogical contexts. For instance multimedia and varying forms of electronic approaches can be easily presented in the WBI environment. However, when attempting to perform the equivalent strategies in a non-virtual environment, the instructor must carry along many forms of equipment and support systems.*

*Finally, Kirby, (1997b) and Starr, (1997) have indicated that the options for security, and speed in turn around time present some of the most important aspects or advantages to this relatively new pedagogical alternative. In most circumstances the information that is presented along with the use of various codes and passwords affords the student and the instructor much greater security than in other circumstances. The advantage here is that other unauthorized individuals have limited access to the material and thus distribution is controlled. Further, due to password protection and access, much of the information can be kept securely between the student and the instructor.*

### Disadvantages

*The Web is not without its weaknesses. Limitations attributed to WBI include the potential for (a) the lack of non-verbal feedback (Barnard, 1997), (b) fragmentation of educational systems, (c) a disconnect with students and faculty, (d) misinterpretation or misreading of asynchronous textual communications (Starr, 1997), and (e) unknowing access of unauthentic, unreliable, and incorrect information (Brooks, 1997). In addition WBI holds the potential for passive instruction (Brooks, 1997) and presents copyright (Starr, 1997) and intellectual property issues.*

*Barnard (1997) indicates that significant amounts of communication during class time can be transmitted through non-verbal behavior. Web-based instruction prohibits the use of such visual cues, which can be used to emphasize specific information and perspectives for student benefit. Further, because of loss of connectivity, students might feel that the educational process is quite removed or fragmented to the degree that they feel they are not learning what they should be learning (Banard, 1997). Starr, (1997) concurs with this point of view but goes further by indicating that distance learning students may even misread or misinterpret information that is being presented due to a lack of contextual cues. Other potential negative aspects of*

*WBI include the potential for providing unreliable or incorrect information (Brooks, 1997). This may occur by connecting to URLs that do not deliver actual or reliable information, in addition to those that have changed or no longer exist. A substantial disadvantage to the instructor, on the other hand, is related to maintaining intellectual property and copyright to the content. While there are controls with regard to instructor and student information via using passwords and other firewalls, once the student has access, the student may download and distribute the information to others thus putting those property rights in jeopardy, whether intentional or not.*

*Another class of weaknesses related to WBI includes issues with computer equipment and related interfacing technology. Included is this equipment area are servers that hold the information, the phone lines or hard wires that connect the equipment, the quality of the software that is used to download the information and, finally, the skill of the people using the equipment. Mingle, (1995), found that not only do phone lines dictate quality and speed in connection, but servers also crash. With these limitations the quality of learning is effected. Mingle also indicated that weaknesses exist due to high cost of building and maintaining networks that can meet the demand of students/learners. Other weaknesses that affect the quality of learning through the WBI process include rapid changes in technology that require large expenditures to keep up with speed and consumer needs, formatting issues around browser settings and preferences, and variance in browsers being used to access the information (Kirby, 1997b; Starr, 1997). Another area that confounds the issue of successfully using WBI is the continued existence of computer or technological illiteracy and lack of motivation of students/learners to make use of web based instruction. An issue related to customer utilization is that of formatting issues in a multitude of browsers, including user control on multi-user machines (Gottschalk, 1996b; Kirby, 1997b; Starr, 1997). A final but not the least important aspect that weakens the learning experience is bandwidth limitation. Briefly stated, bandwidth is the amount of information that can be transmitted across a phone line or dedicated/non-dedicated wiring that connects one s computer to the server that transmits the information. The limitations are those that restrict either at the server or the computer or somewhere between. Bandwidth is generally described in kilobytes. The larger the kilobytes transmitted the quicker the information is downloaded. An unfortunate aspect of bandwidth is that the communication between the two linking computers is based upon the least common denominator. Consequently, if your computer is on a phone line utilizing a modem that is able to transmit at 36 K and the server is able to transmit at 1000 K, the information will be downloaded or received at 36K (Kirby, 1997b; Starr, 1997). Although the disadvantages appear numerous, many problems may be overcome with thoughtful planning and implementation, beginning with understanding the content and pedagogy.*

**Decision Set Two - Pedagogy and Content**

*The second decision set of questions addresses content and pedagogy: What philosophy will underlie instruction? What is the subject matter? What style of instruction will be implemented?*

*The mode of delivery is not critical to effective instructional delivery (Berdine et al., in press). Curricular goals, objectives, and competencies should not change simply because the delivery medium changes (Berdine et al., in press).*

*The instructional paradigm needs to be contextually appropriate and instructionally sound (Barnard, 1997). Constructing meaningful educational materials takes time, commitment, and a level of institutional support (Rodenberg, 1999). Instruction via WBI may require adjustments of strategies, materials, and activities to overcome and balance the limitations in technology and distance education (Cheney, Cummings, & Royce, 1990; Collins, Hemmeter, Schuster, & Stevens, 1996; as cited in Collins & Grisham-Brown, in press, p. 2). The student, however, must remain the focal point of instructional decisions when using online education.*

*McManus (1996) defines pedagogy as  the deliberate organization and presentation of information with the end goal of promoting specific learning (p. 5). Pedagogy is dictated by the educational philosophy of the instructor. Philosophies may vary, some lending themselves to WBI more than others, but too often content and pedagogy are overlooked as technology personnel, not educators, lead the drive toward WBI (Rodenberg, 1999). Excitement about the potential of the technology and its capabilities may lead to a focus on design elements, overpowering the instructional goals and objectives.*

*One approach to the development of Web-based content and instruction is supported in the theory behind online learning. As defined by Firdyiwek,  the pedagogy of online instruction is based on the effective use of electronic learning environments for the development of cognitive skills through access to information, interactivity with tools, and communication (p. 29). Theories of learning and cognition underlie pedagogy. These theories can be viewed in terms of what knowledge is, how it is transferred, and what it is that motivates individuals to learn (Firdyiwek, 1999). Resnick, Greeno, and Collins (1996) have defined three categories of theory: behaviorist/empiricist, cognitive/rationalist, and situative/pragmatist-sociohistoric (situative/pragmatist). In the behaviorist/empiricist model, information is presented in a clearly defined series of instruction reinforced with feedback***.** *This model emphasizes individualized environments, as well as direct skills, teaching, and test-based assessment. The cognitive/rationalist model focuses on interactivity; information is organized in developmental stages of learning and assessment is performance based. Lastly, the situative/pragmatist model stresses  environments of participation. The learner practices active learning, which also serves to assess the learner. Flexibility is a defining element (Firdyiwek, 1999).*

*A second perspective or approach to WBI is taken from instructional design models. According to McManus (1996), there are two basic underlying theories in instructional design: objectivist and constructivist. The objectivist leads the learner through a series of steps, developing materials that will enable the learner to exhibit the desired behavior. Motivation is assumed to be intrinsic or extrinsic to the learner (McManus, 1996). Constructivist theory is nonlinear and provides learners with opportunities to "construct" their own knowledge from the educational materials provided for them. Instructors determine what they intend to create from the instruction, defining a design goal, and then students determine what they want to learn, establishing a learner objective (McManus, 1996).*

*Regardless of the underlying theory, the instructor makes pedagogical decisions and the instructor or a subject-matter expert makes content decisions. Yet, the student and not the technology must remain the focal point of instruction. Further development then cannot take place without identifying* *the needs of the target audience.*

**Decision Set Three - Target Audience**

*The third set of questions in the decision model involves the target audience: Who is the target audience of the WBI? What student characteristics are common to success or failure?*

*Innovative education will lead to a more diverse group of students entering the system, students with greater or differing expectations, varied educational backgrounds, and technological expertise (Plater, 1995). The freedom from time and place permits education to move beyond the campus into rural areas typically prevented from higher educational opportunities due to geographical distances. WBI enables the student to learn wherever they have access to the Internet, with access being critical since not all rural areas have access to the Internet or solely at the local library.*

*Instructors need to know the students: who they are, what they need, what they expect, how they learn best, and when and where this learning will take place (Plater, 1995). Berdine et al. (in press) note several characteristics of students enrolled in WBI that contribute to success. Successful students typically (a) are older and more ambitious, (b) are self-motivated, (c) incur distance or employment barriers to traditional education, (d) have limited access to instructional and technology supports, (e) are inexperienced in research, and (f) need to be current and competitive in their field(s).*

*As individuals engage in WBI, the instructor and the student must develop new skills (Collins & Grisham-Brown, in press). This necessity impacts both immediate and future expectations. Trends in education, business, and technology mandate that both become life-long learners (Plater, 1995); in the process, each becomes both student and teacher.*

*As WBI processes between instructor and student are no longer solely through face-to-face (F2F) contact, communication expectations change, necessitating specification of all modes of support at the beginning of coursework (Institute for Distance Education, 1997) and consideration of both instructor with student expectations. These supporting technologies include phone, mail, fax, and e-mail (Institute for Distance Education, 1997), as well as other means of support as determined by the instructor such as F2F meetings, conference calls, chatrooms, listservs, and two-way audio or visual systems. Throughout the course, students should be encouraged to make use of the communication tools available. Emphasis should be placed on asking questions and requesting clarification when in doubt about assignments or subjects, thus opening the lines of communication and fostering a higher success rate and positive overall experience.*

*The lack of visual cues, a limitation described above, also renders the instructor void of expected feedback from students typically relied upon for signs of understanding and participation. Students, in turn, are void of nonverbal signs as well as verbal emphasis placed by the instructor on important content matter. The absence of eye contact with students can slow the establishment of student-instructor relationships. Communicating also requires greater efforts by the student and instructor. Communication must be initiated and then maintained by ongoing efforts. Barnard (1997) has indicated that it is not uncommon for an instructor to spend four to five hours a week in* *e-mail communication with a class of 50 students. Text-based communication, typically the essence of distance education (DE) communication, can be easily misread; therefore, care must be taken to provide clear communications and prevent miscommunications.*

*In addition, the misconception must be overcome that online course work requires less time than does traditional course work (Caldwell 1993, as cited in Berdine et al., in press). Course work delivered over the Web requires equivalent if not more time than a traditional lecture course. Besides the time spent performing traditional work for a F2F course, students generally have to do more reading, write research papers, participate in practicum experiences and collaborate with other students to implement projects. Additional activities that a student has to carry out regarding WBI courses includes (a) purchasing or acquiring computer equipment that can access the WWW, (b) acquiring a WWW account, (c) utilizing software for interacting with students and faculty, and (d) utilizing email and research software that enables the student to perform the required course requirements. It also is important to note that WBI presents opportunities for off-task behavior through the exploration of links, resulting in longer engagement times than those resulting from on-task behavior and traditional instruction.*

*Traditional instruction has revolved around the philosophy of the student as the passive recipient of information presented in the form of lecture by the instructor. Online instruction requires that the student become an active learner, constructing his or her own knowledge from the direction provided by the instructor. WBI can transform passive students into active students, with instructors guiding and facilitating, aiding them in the tasks of analyzing and synthesizing information (Young, 1997). Educators in WBI become more like coaches and facilitators linking students directly to desired resources and sources of information (Barnard, 1997) rather than acting in the traditional role of delivering information. However, as students continue to be overloaded with information, they will need to establish information competency (Daigle & Jarmon, 1997). Information competency is defined as the ability to access, retrieve, manipulate, relate, understand, and evaluate information (Berdine et al., in press) in order to fulfill expected levels of performance (ROI) -- awareness, information, application, and systematic integration (Todnam & Warner, 1983, as cited in Berdine et al., in press).*

*The basic characteristics of WBI result in changes in the dynamics of the relationship between instructor and student. Not all faculty or students adjust or acclimate well to such a student centered, independent mode of learning. Careful planning to meet student needs, however, will enhance the learning experience. The process in developing courses for seamless transition to WBI not only requires time, but also can be impacted by a number of timelines.*

### Decision Set Four - Timelines

*The fourth decision set involves identifying timelines. When is the course to be delivered over the Web? What timelines are dictating the planning, development, delivery, completion, maintenance, and evaluation of the course? What timelines are dictated by university schedules, semesters or quarters? What timelines are artificially driven?*

*Some of the obvious differences between Web-based and campus-based instruction include an increased reliance on technology, the need for advanced* *development of instructional materials, and a shift in learning responsibilities to the student. As a result, time constraints differ when using WBI (Institute for Distance Education, 1997). According to Young (1997), there is no need to prepare and deliver weekly class sessions, presenting professors with time to do what they most enjoy and do best. Yet the creation of WBI is a time consuming process, especially when performed thoughtfully and thoroughly to include planning, design, development, delivery, evaluation, and maintenance. Gottschalk (1996a) views the development process as an ongoing process conducted in a series of stages, beginning with design. Design considerations include determining the specific needs and characteristics of the audience, and establishing the goals and objectives of the course. The second stage, development, consists of creating a content outline, reviewing existing materials for compatibility with medium and course, organizing and developing content to be as integrated as possible, and selecting and developing materials and methods integrating modalities. In the third stage, the evaluation stage, goals and objectives are reviewed, an evaluation plan is developed and decisions are made regarding the use of formative, summative, quantitative, and qualitative evaluation; then data are collected and analyzed. Evaluation is conducted on the use of technology, course formats, course atmosphere, quantity and quality of interaction, acquisition of content, assignments, tests, support services, student achievement, student attitude, and instructor. The final stage, revision, should be anticipated and completed immediately following course completion (Gottschalk, 1996a). Maintenance then becomes an ongoing task until change merits re-creation of the course, which will begin once again with the planning stage.*

*Hall (1997) has estimated that an online course can be developed in 12 weeks from start to finish. This appears to be an optimistic goal and reaching it will depend on the developer's background and experience with not only the hardware and software, but also the specific software or language being used for development. Often a learning curve is necessitated; as new products and upgrades become available offering enhanced efficiency, learning curves become more the rule than the exception. The pure nature of technology also brings the unexpected; therefore, time for delays due to technological problems with both hardware and software must be incorporated into planning. Technological issues also impair timelines set for course work as problems from both the server or delivery side and the user side can prevent accessibility and result in delays in access to materials and assignment completion, as well as in barriers to communication.*

*Developing coursework for WBI can be a time consuming and an ongoing process. In order to develop successful instruction for use on the Web, considerable thought should go into each and every stage of development, including initial consideration and evaluation. Yet, university driven time constraints may impact development processes, as well as, the availability of needed resources.*

*The rationale for WBI has been addressed, as have pedagogy and content, the target audience, and timeline. The last and greatest level of decision making, however, becomes that of resources. What resources are available to develop, deliver, maintain, and evaluate the course?*

### Decision Set Five - Resources

*Academic policy and processes determine the use of University resources.*

*Resources both within the University and external to the University may affect the decision to pursue WBI due to the associated financial implications. What resources are available to develop, deliver, maintain, and evaluate the course? What resources are available including infrastructure - policy, physical plant, technology, and personnel (Berdine et al., in press)?*

**Academic Policy and Processes**

*The mission of the institution must be considered when deciding whether or not to pursue WBI (Berdine, et al., in press). If the mission does not support the expansion of education to the Web, obtaining necessary support within the university will be difficult. This, however, does not prevent engaging in the development of WBI.*

*Major issues in an Institution of Higher Education s (IHE) DE policy include planning (physical plant and personnel); accountability (faculty incentives and finance and fiscal responsibility); and technology (hardware, software, accessibility, and maintenance) (Berdine et al., in press; Miller & Clouse, 1993-1994). According to W. H. Berdine (personal communication, November 22, 1999), there is typically no existing policy to support WBI. The administrators of educational institutions need to understand and anticipate the restructuring of higher education in the new millennium (Plater, 1995). Not only does the shift towards WBI affect classroom availability, but WBI may necessitate additional faculty, programs for professional development, review of definitions of faculty workloads and awards, and attention to issues surrounding intellectual property rights. Cost effectiveness measures will focus on access, productivity, and quality. In addition, faculty will need access to hardware, software, network resources, and support (Berdine et al., in press). The transformation in IHE toward technology-driven education requires a strong human infrastructure (Daigle & Jarmon, 1997). According to Plater (1995):*

*Universities and colleges must become more effective managers of resources and re-deploy faculty and staff time to meet needs more efficiently at a higher level of quality... Since most other resources are fixed, faculty and staff time is the only resource that can be changed significantly to improve performance" (p. 26).*

*Mingle (1995) claims technology is not about doing what we are doing now -- teaching and learning -- but about doing it better. Policymakers need to realize that the vision is about growth, not budget-cutting. The vision is of a quality education that is relevant, affordable, and accessible anytime/anyplace; a learner-centered and value-centered education that increases student choice and fulfills specific needs (Mingle, 1995). This vision, in turn, compels universal systems, commitment to life-long learning, a shift to a student-centered approach, re-engineering of delivery systems, customized content, gains in productivity, and financing and regulatory reform (Mingle, 1995).*

**Costs**

*WBI requires the consideration of a substantial number of resources, each of which carries with it a cost. Costs associated with WBI include: (a) purchase/lease of instructional materials, including software and hardware; (b) equipment maintenance, (c) telecommunication fees - broadcasting, connecting, delivering, and disseminating information; (d) personnel, including* *full-time faculty, adjunct faculty, graduate and undergraduate assistants, technical personnel, clerical personnel, contracted personnel from other departments, and outside designers and consultants; (e) components of direct costs - planning, course production, course maintenance, mediating/tutoring, and student assessment (Mingle, 1995); (f) delivery of the instruction and associated costs; and (g) time and money for training faculty and staff in the use of hardware and software (Hall, 1997). DE delivery systems consist of a complex mix of capital, operating, technological, and human-labor costs (Mingle, 1995). As measures to cut costs continue, WBI is a suitable alternative (Young, 1997). Miller and Clouse (1993-1994) center cost effectiveness on access, productivity, and quality (efficient instruction) (Berdine et al., in press).*

*When considering costs in WBI, development costs alone can be deceiving. The development cost of a low-tech and low-end course is approximately $15,000, whereas a high tech course with all the "bells and whistles" may be as much as $30,000 or more (Berdine personal communication, November 22, 1999). Responses to personal survey of cost estimates for a fully interactive instruction ranged from $200 per page to $800 per page. Cost is a factor of a co-mingling of elements and thus difficult to compare meaningfully. The initial cost of the development of WBI is greater than the costs incurred once the process and materials have been obtained (Gregory, as cited in Hall, 1997). Perception of audience need, learner objectives, and the array of tools required will drive the process of creating WBI, thus influencing its associated costs.*

*WBI potentially offers several cost benefits: (a) a smaller number of faculty can reach a larger number of students; (b) expenses for physical building space and operational costs such as air conditioning, electricity, water, etc. may be reduced; and (c) students carry the financial responsibility of accessing the hardware and software necessary to complete course requirements. The costs of WBI, however, cannot always be addressed in terms of a return on investment. Klevans (1987, as cited in Berdine, et al., in press) suggests looking at the cost of meeting the need versus the cost of ignoring the need. Several critical cost factors to the delivery of WBI are addressed in greater detail below.*

**Physical space.** *Physical resources can be defined as typical bricks and mortar or physical space. WBI limits physical space requirements. A classroom is no longer required for delivery, freeing up a valuable commodity within a university. WBI requires physical space only for the server, the development hardware, and, possibly, for software storage. A computer laboratory housing hardware and software for production may already exist within the department or university, thus providing the needed physical space for development of instruction and materials.*

**Tools - hardware.** *Planning for WBI includes determining the location of the instruction. Instruction can be stored on a university server, a department server, the instructor's server (set up and managed by the instructor), or on a server belonging to a partner organization. Once location of instruction has been determined, the capabilities and needs of the server must be identified. These include storage space, server software features impacting Web design, access for development, monitoring, and maintenance. Compatible course work can then be developed. Access to a digital camera, digital camcorder, scanner, color printer, zip drive, VCR, and a recordable CD-ROM drive also may be desirable.*

**Tools - software.** *Development of the instruction and associated materials can take place on any computer system meeting minimal software requirements. Increased capabilities in software can result in greater quality and efficiency, but also require more random access memory (RAM) and hard drive space for materials produced. Not all users will be accessing the course with computers whose specifications match those of the development machine or server, so state-of-the-art equipment may not be appropriate. The more technology incorporated into the design, the less accessible the instruction becomes to the majority; therefore, students should be provided with high caliber instruction even if using a slower speed computer and modem.*

*It is critical that WBI incorporate accessibility for individuals with disabilities. Guidelines for creating accessible Web sites can be found on the Web itself. Sites also exist which provide feedback on the quality of access provided by a Web site. Again, it is important to stress that although the inclusion of multimodal instruction may aid in learning for an individual with a sensory impairment, it also may serve as a barrier to others. Cautions are given on the use of multimedia since additional modes may interfere with accessibility software and hardware and vice versa. Yet Coombs and Banks (1999) surmise that the use of redundant modes of information display makes the information accessible to all individuals, including those with disabilities, and meets the preferred learning styles of individuals, although the subject of learning styles itself remains controversial. Coombs and Banks (1999) also contend that today s students have been raised on multimedia and its components.*

*It must be determined whether the course will be developed in HTML or using pre-packaged software. User-friendly Web page development software can be purchased to create Web sites, although knowledge of HTML is helpful for editing purposes. Software can be used to create, alter, and animate images, as well as to create full motion video and high quality sound. Authoring software also provides opportunities to incorporate interactive multimedia components, and additional utilities can aid in creating searchable, Web-accessible document files. However, if the course will include audio and/or video, several factors must be considered: the quality of the media and its potential download speeds, the worthiness of including such media, the possible necessity for the download of plug-ins for accessibility, and the source of plug-ins should the user require them. In addition, applications vary in both capabilities and costs; as capabilities increase, costs and complexity of use rise as well. Shareware or freeware also may perform some desired functions.*

*Interactivity is one of the attractive components of Web-based education and is not limited to the use of hypertext and the media. Asynchronous and synchronous communications can take place in the form of email, listservs, chat rooms, and discussion areas. These components also vary as to whether one must go to a specific separate location to access messages versus receiving the information in the form of e-mail.*

*Courseware tools also have been developed over the past few years to aid in the development of electronic learning environments by integrating access to information, interactivity, and synchronous and asynchronous communication (Firdyiwek, 1999). Kearsley (1998, as cited in Firdyiwek, 1999), however, points out that the increase in options and features available to instructors and course designers can inhibit the selection of suitable functions for course content areas. Firdyiwek (1999) reviewed three tools purported to handle the design, delivery, and management of online courses: WebCT, TopClass, and*

*Web Course in a Box (WBC). According to Firdyiwek no one tool appeared superior in comparison to the others as each appeared to have both advantages and disadvantages with regard to the handling administrative and instructional tasks. Firdyiwek (1999) then concludes that simply looking at features alone does not provide a clear answer as to which tool is best. Firdyiwek s full review can be found in the article, Web-based courseware tools: Where is the pedagogy? in the 1999 issue of Educational Technology, 39 (1), 29-34.*

**Copyright** *Lastly, copyright issues often arise when developing Web-based instruction and the supplementary course materials to be presented over the Web. Courses may not incorporate any course content and materials developed by others without obtaining the creator s permission. After spending the time and energy developing a course, copyrighting all material is desirable. Weiss (1996, as cited in Berdine et al., in press) suggests copyrighting all materials developed for DE as a standard operation.*

**Personnel - infrastructure.** *It is suggested that the student-teacher classroom model, though interactive, will no longer dominate, but it will not disappear (Plater, 1995). Human infrastructure is the foundation of student learning, and physical, technological, and human elements must be integrated (Daigle & Jarmon, 1997). Daigle and Jarmon (1997) and Plater (1997) believe faculty, as well as students, should be just-in-time, life-long learners.*

*Instructors are already spending less time on teaching and more on scholarship and research (Honeyman & Bruhn, 1996, as cited in Berdine et al., in press). When planning, delivery, and maintenance are included, DE appears to require more rather than less faculty time (Berdine et al., in press). As a result, collaborative efforts are encouraged to share expertise and resources, as well as to establish faculty accountability within the peer group. Partnerships and the trend in resource sharing have proven to be mutually beneficial to institutions and students (Barnard, 1997).*

*Guiding principles for faculty development as denoted by Daigle and Jarmon (1997) must: (a) be integrally related to the mission of the institution, (b) be based on empirical data linking technology to learning outcomes of students, (c) employ a collaborative model (i.e. train the trainers), and; (d) be seen as part of infrastructure in serving students. Human infrastructure is critical to total institutional infrastructure; technology is impacting not only physical infrastructure but human infrastructure as well. As new teaching-learning paradigms evolve, faculty must be strengthened through training and university supports. Investment in the development of faculty will build the human infrastructure essential to technology-driven higher education (Daigle & Jarmon, 1997). In order to meet the multitude of needs and goals in DE, faculty must have convenient, universal, and affordable access to hardware, software, network resources, and support, as well as assistance to foster professional development (Daigle & Jarmon, 1997).*

**Personnel - preparation**. *Because "poorly planned and delivered instruction can sabotage any learning situation" (Berdine et al., in press), the development of Web-based instruction merits the consideration of a number of variables concerning knowledge and experience. The Web is not an interactive tool unless elements are incorporated to promote that interaction. Creating interactive and multimedia courses requires a level of technical expertise many instructors lack (Young, 1997). McFarlane and Turner (1995) find knowledge of* *computers and of how to access electronic information essential for educators and administrators. The development of WBI, however, requires an even higher level of understanding.*

*Berge (1998) states, "The constant learning cycle (as it gets simpler at the user end, it gets more complicated at the provider end)" (p. 2). Personnel preparation programs increasingly offer instruction to promote technological competence (Berdine et al., in press) and knowledge in DE, but in the meantime, faculty will avoid WBI or their products will lack quality and expertise unless they are provided with opportunities for professional development and supplied with outside assistance as needed. Pedagogy, however, should remain the responsibility of the instructor and content the responsibility of the instructor or a subject matter expert. University graduate students with the desired expertise may be hired from within or outside the department for $8 to $10 per hour to assist with development and, possibly, with subject matter. Outside consultants or contractors also can be hired, though given the fast pace of technological innovation, individuals marketing themselves as consultants or contractors may not always possess sufficient knowledge and expertise, expertise being defined as knowledge of content, pedagogy, and the tools available to offer WBI. Web page developers external to the University may cost as little as $30 to $100 per hour, though fees may be higher depending on the nature and extent of the development.*

*Other participants in establishing the desired Web-based course must have an understanding of and level of expertise in important characteristics of WBI. For example, Kirby (1997b), of the WBT Information Center, suggests eight rules to follow in designing Web-based training: (a) establish a formal development process focusing on the needs of the user; (b) select media based on defined learning objectives; (c) provide the user with opportunities to interact with the information; (d) adapt products to the user's knowledge and abilities, providing remediation when necessary; (e) although controversial due to the lack of empirical evidence, consider the types of learners that will be accessing the instruction; (f) abandon linear thinking; (g) clearly demonstrate respect for the learner; and (h) test all aspects of the instruction with real users. Starr (1997) considers the following to be essential design considerations for Web-based courses: (a) learner analysis, (b) setting analysis (hardware and software), (c) internal resources, (d) external resources, (e) collaboration, (f) Web design features, (g) development, (h) updating and expansion, and (i) evaluation. A number of additional print and electronic resources exist which outline characteristics of quality WBI, as well as tenets for successful Web design. Those selected for inclusion above were incorporated to indicate some of the many factors that must be considered when developing WBI.*

**Personnel - expectations.** *Engaging in WBI requires not only the instructor or developer to have a level of expertise in WBI but the student as well. Both must possess a level of knowledge or aptitude enabling them to perform the basic operations of both the computer hardware and system software (operating system). Both must be able to apply simple problem solving techniques as well as have a general understanding or foundation in how to navigate the WWW and use functions such as e-mail and/or fax. If they do not possess these abilities, support must be provided. Students also will require knowledge in basic software applications needed for the completion of assignments.*

**Personnel - student support.** *The remote student in WBI will also need* *access to the same student services as on-campus students, such as registration, tuition payment, student support, examinations, and library services. Although improving (Mingle, 1995), electronic access to university resources and support must continue to improve to the point of transparent access. Seamless access to library resources is an innate goal (Barnard, 1997) for student success and the overall success of DE. In WBI, librarians become partners (Plater, 1995), with both the instructor and librarian offering direction and guidance to students (Barnard, 1997).*

**Personnel - marketing*.*** *Creating WBI without marketing and promoting the availability of such course work deflates the potential profitability that increased enrollment can offer. It also prevents meeting the identified need. If the department or university does not have an individual or group of individuals designated to promote Web-based courses, marketing efforts will become a faculty responsibility. Marketing can be time-consuming and costly, but failure to do so also can increase overall costs of a Web-based course.*

### Decision

*Although popular, the decision to pursue WBI may not be the most appropriate for all individuals. Careful inquiry must be made in several areas. The decision making model proposed can lead to a checklist of critical questions to ask prior to pursuing WBI. Although the list is not totally inclusive, key elements for successful WBI instruction have been addressed. First, because the reasons for pursuing WBI vary, a concrete motive for engaging in WBI must be realized. Second, not all instruction is appropriate for or lends itself to the Web. Identify the style of instruction that will be used, the content to be covered, and the outcomes desired. Remember that learner goals should be at the forefront of WBI. Third, determine the target audience as well as the characteristics for successful participation in WBI. Not only will the audience affect the overall decision to engage in WBI, but the audience also will affect development decisions; instructional elements will need to address factors necessary for successful learning experiences. Fourth, although ultimately dictated by decisions on what to include in the online instruction, timelines will impact decision-making. Time is a factor in planning, design and development, completion, delivery, maintenance, and evaluation. Is that time available and justifiable? The fifth and last probe, inquiring into the resources available for the development of effective, quality WBI, may be the most important area of decision making. The depth and breadth of resources to be considered can prove overwhelming. Resources impact the decision to engage in WBI at all levels, from administration to software and student services to levels of expertise.*

*If engaging in the five decision sets described in the decision making model leads to the decision to pursue WBI, the model can then provide direction for careful planning and development. Decisions will need to be made on the resources that will be used in the online instruction. However, if questions or apprehensions remain after reviewing the critical questions in the decision model, the decision can be made to pursue WBI through successive approximations moving gradually through the categories described previously by Hall (1997). Replacing text with pictures and other media does not necessarily bring about enhanced learning. The development of an online syllabus and readings could be the entrance into WBI, followed by the incorporation of hyperlinks and the addition of text and image-based* *instructional materials (Brooks, 1997). Professors are currently creating Web pages for courses, syllabi, readings, and links (Barnard, 1997). E-mail may initially serve as the primary mode of communication, followed by the incorporation of a listserv, then synchronous chats. Additionally, online tutoring can be followed by online exams (Brooks, 1997). The decision sets described in the model can provide critical insight in deciding whether to pursue WBI completely or in stages.*

*Adams (as cited in Hall, 1997) has developed a Decision Aid for WBI which assigns point value to the responses made to each of 27 considerations. The total value then falls into ranges suggesting the future direction to be taken in regard to the desired online course. Following review of the sets of questions suggested, the aid can serve as a final step. The aid can be found in Hall's Web-based Training Cookbook or obtained from the publisher s Web site, www.wiley.com/compbooks/hall.*

**Summary and Conclusions**

*This article has provided an overview of sets of questions to aid in the decision to engage in WBI: Why should WBI be used? What is the rationale for its use? What will be its content and pedagogy? Who will be the target audience? What timelines will be imposed? What resources will be required? The questions identified in the decision making model for WBI affect each of the stages of WBI.*

*Unfortunately, although WBI raises many questions, there are no easy answers. Brooks (1997) indicates that there is little solid empirical evidence to consult when considering WBI. The lack of empirical evidence supports the need for additional research in WBI, yet fast-paced technological innovation and its sheer abundance serve as barriers to relevant and current research. Literature reflects an increase in the implementation of effective DE (Winn, 1990, as cited in Berdine et al., in press). Perhaps by defining what is and what is not WBI or expanding upon the suggested decision sets, research topics related to WBI can be refined that will enable replication and result in empirically based implementation. Web-based instruction has heretofore been defined in broad terms, resulting in variation and confusion as to exactly what constitutes Web-based instruction. The very availability of such a wide array of possibilities in the production of multimedia adds confusion in that an immense combination of modalities of varying qualities can be incorporated. The server, the computer system of the user, and related services such as the internet service provider all impact the way the instruction will be experienced, as does the instruction itself. Although evaluation concerns exist for WBI, the development of such materials continues, perhaps due to our confusion as to the operational definition of WBI, not to mention quality of WBI.*

*In addition, much depends on individual situations and circumstance, as well as personal preference. No course or project is the same. As the design, delivery, instructional approach, etc. of each online learning experience is unique, so is that of the instructor and the student. As a result, generalizations are not possible. Yet as the amount of information available within each of the sets of questions described increases, decisions can be made with greater confidence and support.*

**References**

*Barnard, J. (1997). The World Wide Web and higher education: The promise of virtual universities and online libraries. Educational Technology, 37 (3), 30-35.*

*Berdine, W. H., Burleson, R. B., Case, D. A., Liaupsin, C. J., & Zabala, J. S. (in press). Administrative guidelines for distance education program development. Reston, VA: Council for Exceptional Children.*

*Berge, Z. (1998). Concerns of online teachers in higher education. [Online]. Available: http://jan.ucc.nau.edu/~mpc3/berge/iste98.html*

*Brooks, D. W. (1997). Web-teaching: A guide to designing interactive teaching for the World Wide Web. New York: Plenum Press.*

*Collins, B. & Grisham-Brown, J. (in press). Guidelines for distance learning content delivery. Reston, VA: Council for Exceptional Children.*

*Coombs, N. & Banks, R. (1999). Enhancing Web instruction: Using streaming audio and video. [Online]. Available: http://www.isc.rit.edu/~easi/itd/*

*Daigle, S., & Jarmon, C. (1997). Building the campus infrastructure that really counts. Educom Review, 31 (4), 35-38.*

*Firdyiwek, Y. (1999). Web-based courseware tools: Where is the pedagogy? Educational Technology, 39 (1), 29-34.*

*Gottschalk, T. H. (Ed.). (1996a).Guide #3: Instructional development for distance education. [Online]. Available: http://www.uidaho.edu/evo/dist3.html*

*Gottschalk, T. H. (Ed.). (1996b). Guide #7: Computers in distance education. [Online]. Available: http://www.uidaho.edu/evo/dist7.html*

*Hall, B. (1997). Web-based training cookbook: Everything you need to know for online training. New York: John Wiley & Sons, Inc.*

*Institute for Distance Education, University System of Maryland (1997). Three models of distance education. [Online]. Available: http://www.umuc.edu/ide/modldata.html*

*Khan, B. H. (Ed.). (1997). Web-based instruction. Edgewood Cliffs, NJ: Educational Technology Publications.*

*Kirby, T. (Ed.). (1997a). Rules for good WBT design. [Online]. Available: http://www.filename.com/wbt/pages/primer.htm*

*Kirby, T. (Ed.). (1997b). WBT Advantages and Disadvantages. [Online]. Available: http://www.filename.com/wbt/pages/advdis.htm*

*McFarlane, F. R., & Turner, T. (1995). A glimpse into the future for technology and distance education. Journal of Rehabilitation Administration, 19 (4), 327-328.*

*McManus, T. F. (1996). Delivering instruction on the World Wide Web. Unpublished manuscript, University of Texas at Austin.*

*Miller, C. D., & Clouse, R. W. (1993-1994). Technology-based distance learning: Present and future directions in business and education. Journal of Educational Technology Systems, 22 (3), 191-204.*

*Mingle, J. R. (1995). Vision and reality for technology-based delivery systems in postsecondary education. Paper presented at the Governor s Conference* *on Higher Education, St. Louis, MO.*

*Newsweek. (1999m September 20).The dawn of e-life. New York, Newsweek, 38-41.*

*Plater, W. M. (1995). Future work: Faculty time in the 21st century. Change, 27 (3), 23-33.*

*Russell, T. L. (1997). The no significant difference phenomenon. Raleigh, NC, Office of Instructional Telecommunications, North Carolina University.*

*Rodenberg, D. (1999). Commentary: Web-based learning: Extending the paradigm. Technology Source. [Online]. Available: http://horizon.unc.edu/TS/commentary/1999-11.asp*

*Spooner, F., Spooner, M., Algozzine, B., & Jordan, L. (1998). Distance education and special education: Promises, practices, and potential pitfalls. Teacher Education and Special Education, 21 (2), 121-131.*

*Starr, R. (1997). Delivering instruction on the World Wide Web: Overview and basic design principles. Educational Technology, 37 (3), 7-15.*

*Young, J. R. (1997). Rethinking the role of the professor in an age of high-tech tools: Will 'unbundling' of tasks give faculty members more time or put them on the sidelines? The Chronicle of Higher Education, XLIV (6), A26-A28.*

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# Letter To Congress from Richard Riley Secretary of Education

**Editor's Note**: *Awareness, review and analysis of the research embodied in the documents released by the U.S. Department of Education, Office of Educational Technology, December 2000, is, we believe, a mandate for all dedicated distance learning educators. These excerpts are from the new National Educational Technology Plan, "e-Learning, Putting a World-Class Education at the Fingertips of All Children". The full text is available at http://www.ed.gov/Technology/elearning/index.html. A second document, the final report of the Web-based Education Commission, will be forthcoming in our June issue. Both reports were issued while Dr. Linda G. Roberts was Director of the Office of Educational Technology.*

*December 2000*

*Dear Member of Congress:*

*In response to the tremendous potential for improving educational opportunities through the effec- tive use of technology I released the nation's first educational technology plan in 1996. That plan set forth a far reaching vision for widespread improvements in teaching and learning guided by four national educational technology goals.*

*We have made remarkable progress toward achieving the 1996 educational technology goals. Due in large part to federal programs such as the Technology Literacy Challenge Fund and the E-rate program, many of the nation's teachers and students are beginning to reap the benefits of increased access to computers and the Internet. That progress is a testament to the commitment of local com- munities, states, the private and non-profit sectors, educators, the federal government, and others to integrate technology into America's schools.*

*Building on what has been accomplished, I am pleased to share with you e-Learning. Putting a World-Class Education at the Fingertips of All Children. This plan shows where progress has been made since 1996, where new opportunities exist, and where challenges remain. E-Learning outlines five new national educational technology goals. It proposes national, state, local, and private sector actions to ensure that all of our nation's teachers and students have the opportunity to take advantage of* *the power of new and emerging technologies for widespread improvements in teaching and learning - today, tomorrow, and far into the future.*

*Leadership is required to sustain our commitment to the future. I hope that the Congress and the new administration will continue to support state and local education leaders in using technology to strengthen the academic achievement of all children. National progress on these five goals is an opportunity that the country cannot afford to miss.*

*Yours sincerely,*

*Richard W Riley*
*Secretary U.S. Department of Education*

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Email comments to the Editor

# Putting a World-Class Education at the Fingertips of All Children

*U.S. Dept. of Education*

**EXECUTIVE SUMMARY**

*In response to the educational opportunities made available by dramatic technological innovations in the early and mid 1990s, US. Secretary of Education Richard Riley released the nation's first educational technology plan in 1996, Getting America's Students Ready for the 21st Century: Meeting the Technology Literacy Challenge. This plan presented a far reaching vision for the effective use of technology in elementary and secondary education to help the next generation of school children to be better educated and better prepared for the evolving demands of the new American economy*

*Due in large part to markedly increased federal, state, local and private investment in technology for education, the nation has made tremendous progress toward achieving the 1996 national educational technology goals. These investments in computers and Internet access, professional development, technical support and content have allowed many elementary and secondary schoolteachers and students to reap the benefits of powerful teaching and learning applications.*

*The latest research and evaluation studies demonstrate that school improvement programs that employ technology for teaching and learning yield positive results for students and teachers. Given that many schools and classrooms have only recently gained access to technology for teaching and learning, the positive outcomes of these studies suggest a future for education that could be quite bright if the nation maintains its commitment to harnessing technology for education.*

*The adoption of new and emerging technologies by schools and classrooms offers even more reason to be hopeful. With sufficient access and support, teachers will be better able to help their students comprehend difficult-to-understand concepts and engage in learning, provide their students with access to information and resources, and better meet their students' individual needs. If we take advantage of the opportunities presented to us, technology will enhance learning and improve student achievement for all students.*

*Given the tremendous progress made in integrating technology into teaching and learning and the continued advances in the affordability and capabilities of technology the need to move beyond the 1996 goals became evident. In the fall of 1999, the U.S. Department of Education undertook a strategic review*

*and revision of the national educational technology plan, in consultation with the full range of stakeholders: educators, researchers, policymakers, students, parents, and higher education, industry and other leaders. The outcome of this strategic review was five new national goals for technology in education.*

*Working together to achieve these goals constitutes a major leadership imperative facing those seeking widespread improvements in teaching and learning. As a nation, we should pledge to meet these new goals:*

**NATIONAL EDUCATIONAL TECHNOLOGY GOALS**

*Goal 1: All students and teachers will have access to information technology in their classrooms, schools, communities and homes.*

*Goal 2: All teachers will use technology effectively to help students achieve high academic standards.*

*Goal 3: All students will have technology and information literacy skills.*

*Goal 4: Research and evaluation will improve the next generation of technology applications for teaching and learning.*

*Goal 5: Digital content and networked applications will transform teaching and learning.*

*"New technologies can be an incredible tool of empowerment in schools, homes, businesses, community centers and every other part of our civic life.... Imagine if computers and internet connections were as common in every community as telephones are today; if all teachers had the skills to open students' eyes and minds to the possibilities of new technologies; if every small business in every rural town could join worldwide markets once reserved for the most powerful corporations just imagine what America could be."*

**PRESIDENT CLINTON**

**A NATIONAL STRATEGY FOR TECHNOLOGY IN EDUCATION**

*In committing to achieve these goals, everyone has a role to play: federal, state and local governments; education; nonprofit organizations and associations; the private sector; communities; and families. For each of these goals, there are numerous strategies that can be undertaken to ensure continued progress in using technology effectively for education.*

*Goal 1: All students and teachers will have access to information technology in their classrooms, schools, communities and homes.*

*An integral part of school improvement and reform efforts in the 21st century in the United States and abroad, will be student and teacher access to educational technology, such as computers connected to the Internet. Universal access to the Internet will help end the isolation of teachers; exponentially expand the resources for teaching and learning in schools and classrooms; provide more challenging, authentic and higher-order learning experiences for students; and make schools and teachers more accountable to parents and communities.*

*The quality of Internet access is critical. Broadband access will be the new standard. Slow, unreliable connections that cannot support interactivity or rich multimedia content will no longer be sufficient. To take advantage of access to* *technology for improved teaching and learning, it will become increasingly important to build and support network infrastructures-wired or wireless, desktop or handheld-that allow multiple devices to connect simultaneously to the Internet throughout every school building and community in the nation.*

*To realize the goal of universal access to educational technology for students and teachers, we should ensure sustained and predictable funding for technology; ensure that technology plans reflect the educational needs of students and are regularly updated; improve the affordability, reliability and ease of use of educational technology; ensure that school buildings and facilities are modern; strengthen our commitment to eliminating the digital divide; and ensure that all students have equal opportunities to access and use technology*

*Goal 2: All teachers will use technology effectively to help students achieve high academic standards.*

*Most teachers have been prepared for a model of teaching dramatically out of step with what is needed to prepare the nation's students for the challenges they will face in the future. Recent reports by the American Council on Education, the CEO Forum on Education and Technology, the Milken Exchange on Education Technology the National Commission on Mathematics and Science Teaching for the 21st Century, and the National Council for Accreditation of Teacher Education, among others, all identify opportunities to enhance teacher quality and teacher preparation, particularly as they relate to the effective use of technology in education.*

*Ensuring that the nation has effective 21st-century teachers requires more than just providing sufficient access to technology for teaching and learning. We should improve the preparation of new teachers, including their knowledge of how to use technology for effective teaching and learning; increase the quantity quality and coherence of technology-focused activities aimed at the professional development of teachers; and improve the instructional support available to teachers who use technology.*

*Goal 3: All students will have technology and information literacy skills.*

*The need to prepare students with the skills they need to participate fully in our increasingly technological society has become a major priority for the nation. A meaningful, unified approach to providing students with the skills they will need for their futures must be more than a checklist of isolated technology skills; rather, these skills are only a first step in assuring all our children become proficient information and technology users.*

*Also necessary are information problem-solving skills, such as how to define tasks, identify information seeking strategies, locate and access information, determine information's relevance, organize and communicate the results of the information problem-solving effort and evaluate the effectiveness and efficiency of the solution. The call for this new "21st-century literacy" in no way supplants current efforts by states and districts to set and even raise academic standards for students; it simply reflects the fact that the bar for an educated citizenry and workforce continues to rise to reflect changes in society.*

*In requiring these skills of students, we will ensure that the opportunities made possible through the use of technology will be available to all students as they progress through school, regardless of personal or socioeconomic factors.*

*Even for those students who do not pursue technology careers, ensuring technology and information literacy skills will provide a number of benefits.*

*To ensure that students are prepared for their future we should: include technology and information literacy in state and local standards for what students should know and be able to do; ensure students use technology appropriately and responsibly; develop new student assessment tools; and strengthen partnerships with industry to help meet the workforce needs of the future.*

*Goal 4: Research and evaluation will improve the next generation of technology applications for teaching and learning.*

*At the dawn of the 21st century, we are still at the beginnings of a technological revolution that is bringing dramatic changes to our society. This technological revolution will not automatically translate into a similar revolution in teaching and learning. While we have learned a tremendous amount about the implementation and use of technologies for teaching and learning in the past few years, the need for an expanded, ongoing national research and evaluation program to improve the next generation of technology applications for teaching and learning is profound.*

*To implement such a program requires a sustained, multi-disciplinary collaboration of learning scientists, technologists, and subject-matter experts. Numerous organizations have pointed out the urgency of this national need, including the President's Committee of Advisors on Science and Technology the U.S. Department of Education, the National Science Foundation, the National Research Council, private charitable foundations, independent research institutes and representatives of academia.*

*To ensure that research and evaluation will improve the next generation of technology applications for teaching and learning, we should: initiate a systematic agenda of research and evaluation on technology applications for teaching and learning; encourage state and local evaluations of technology programs; and support the dissemination and use of research-based information to improve teaching and learning.*

*Goal 5: Digital content and networked applications will transform teaching and learning.*

*Digital content and networked applications will support transformative changes in our approaches to teaching and learning. In order for these changes to lead to increased educational opportunities for all students, digital content and networked applications must be independently judged to be of high quality (both in terms of grounding in learning science and pedagogical effectiveness), well-documented, comprehensive and available for all grades and subject areas, and have the power to inspire or motivate students. In addition, they must be easy to find and access, easy for students and teachers to use, and accessible to people with disabilities.*

*Today, there exists tremendous opportunities for the creation of powerful digital content and networked applications. For instance, digital content and networked applications offer direct opportunities to enhance learning by helping students to comprehend difficult-to-understand concepts; helping students to engage in learning; providing students with access to information and resources; and better meeting students' individual needs. In addition,* *technology applications can increase parental involvement and improve the accountability and efficiency of school administration.*

*To ensure that digital content and networked applications will transform teaching and learning, we should: ensure administrators and policymakers are technologically literate; support efforts to increase our understanding of how to improve teaching and learning through partnerships within and across sectors; identify leadership opportunities provided by technology to offer better ways of accomplishing educational goals; continue and expand efforts to digitize rich educational materials consistent with copyright laws; encourage the aggregation of demand for resources and services to attract better and more effective technology-based services for teaching and learning; support educators and technologists in defining what digital content and networked applications should be available to support teaching and learning; remove barriers to purchasing digital content and networked applications; recognize developers of high-quality digital content and networked applications and exemplary adoption of educational technologies; and support the integration of digital content and networked applications into state and local standards and curricular frameworks.*

**THE LEADERSHIP IMPERATIVE**

*The use of technology in education must remain a national priority. It must be at the core of the educational experience, not at the periphery. Now is the time to renew our commitment to the future by challenging the nation to take bold action in hastening the coming of the future of education. The leadership imperative is clear. Collectively, these new goals for technology in education represent an updated, high-level strategy for ensuring that all students will benefit from enhanced learning opportunities afforded by new and emerging communications and information technologies.*

**CHAPTER I**

**INTRODUCTION**

*"Every child in America deserves a 21st century education and access to 21st century technology"*

**VICE PRESIDENT AL GORE**

*In response to the educational opportunities made available by dramatic technological innovations in the early and mid 1990s, US. Secretary of Education Richard Riley released the nation's first educational technology plan in 1996, Getting America's Students Ready for the 21st Century: Meeting the Technology Literacy Challenge. To help the next generation of school children to be better educated and better prepared for the evolving demands of the new American economy, the 1996 plan presented a far-reaching vision for the effective use of technology in elementary and secondary education. The plan reflected four national educational technology goals set forth by President Clinton and Vice President Gore:*

- *All teachers in the nation will have the training and support they need to help students learn using computers and the information superhighway.*
- *All teachers and students will have access to modern multimedia computers in their classrooms.*

*Every classroom will be connected to the information superhighway.*

- *Effective software and online learning resources will be an integral part of every school's curriculum.*

*The 1996 national educational technology plan provided the nation with a blueprint for the widespread, effective use of technology in education.*

*Due in large part to markedly increased federal, state, local and private investment in technology for education, the nation has made tremendous progress toward achieving the national educational technology goals first laid out in 1996. These investments in computers, Internet access, professional development, technical support and content have allowed many elementary and secondary school teachers and students to reap the benefits of increased access to powerful teaching and learning applications. With emerging evidence of effective uses of technology in education, there is far-reaching public support for the increased use of technology in elementary and secondary education:'*

- *69 percent of Americans believe that the use of computer technology has improved the quality of instruction in their locals schools; and*
- *82 percent believe that schools should invest more in computer technology for instructional purposes.*

**Net Courses for High School**

*The Virtual High School (VHS) - supported by a federal Technology Innovative Challenge grant - is a consortium of high schools that offers network-based courses (NetCourses) taught by consortium teachers for students in consortium schools. Teachers in the VHS pool, with the help of experienced facilitators, design and offer NetCourses over the Internet. Each VHS school also provides a part-time coordinator who acts as liaison among students, the VHS teachers, and the central VHS administrative staff.*

*The growth of Virtual High School is impressive. In September 1997, VHS offered Internet-based courses for the first time to about 500 students in 27 schools in 10 states. By May 2000, after six semesters of operation, VHS offered 87 different courses to about 1,700 students in 112 schools located in 29 states. The number of students enrolled and the average number of students per NetCourse have been steadily increasing. The NetCourses, which are often quite challenging, include topics like economics, Shakespearean literature, nuclear physics, world conflict and peacemaking, and various languages of computer programming.*

*The Virtual High School often serves students who would not have access to such a variety of courses. Small school size and remote location often limit access to adequately trained instructors to teach a varied and sometimes specialized selection of courses. In fact, statistics show that over 80 percent of the schools participating in the VHS have enrollments fewer than 1,500 students. Half of these schools have fewer than 800 students. As VHS has developed, some of these small schools have come up with creative ways to get involved in VHS, and VHS has supported them in order to make their participation possible. In some cases whole districts and geographic regions have organized into "sub-cooperatives," pooling their local resources to take advantage of VHS courses. The bottom line is that instead of schools finding an expensive solution, or no solution at all, to the challenges that many schools face in meeting the demand of course offerings, they are able to work with VHS to develop creative solutions - all without hiring new staff or adding a new* *building.*

*The principal of Monroe Senior High School, a very small school (the smallest K-12 school in Alabama) located in rural Southwest Alabama with a total enrollment of 110 students - grades K-12 - has high praises for their participation in VHS. She feels that had it not been for VHS, their school would not have ranked in the 60th percentile on the Stanford-nine Test, nor would it have had 99 percent of its Juniors (Class of 2001) to pass all required parts of the new state exit exam. Monroe hopes to be able to acquire more computers in the near future so they can accommodate more students in the program. Right now, because of the wide range of interest in VHS, they have more students than space.*

*School principals and others at participating VHS schools had reported that they believe the courses to be of high quality. A recent evaluation of VHS conducted by SRI International confirmed that VHS courses provide students with high-quality curriculum content.*

*"One of the most exciting things i use the Internet for is getting up-to-date news across the world. I did a thesis paper last year on china and i was able to use newspapers from Hong Kong as research. It would have been impossible to get such new information from those sources using conventional methods."*

## STUDENT, INTERNET CHAT WITH U.S. DEPARTMENT OF EDUCATION

*With increased access to technology in schools and classrooms and with public support for its use, we can now look to a future where the Internet and other emerging information technologies have the potential to foster even more dramatic improvements in education. We have the potential to create an educational system enhanced by technology that could be better suited to the needs of educators, students and their families. Indeed, visionary school leaders foresee advances in our understanding of what learning really is, how diversified it is, and which methods are flexible enough to meet the learning needs of all students.*

*For us to realize these visions, technology in educa- tion must remain a national priority. It must be at the core of the educational experience, not at the periphery Indeed, emerging technologies will allow us to develop new content to address evolving conceptions of the skills and knowledge needed to succeed in today's global society Technology will enable new teaching strategies and tools to increase student acquisition of necessary skills and knowledge. It will also offer dramatic improvements in how we measure student progress in attaining the necessary skills and knowledge. If technology is to achieve genuinely transforming improvements in schooling for all students, it must be at the center of school reform and improvement efforts.*

*The leadership imperative is clear. Now is the time for us to renew our commitment to the future of education. This report will show where progress has been made, where new opportunities exist, and where challenges remain. Most important, it proposes national, state and local actions that will ensure that all of our nation's teachers and students will have the opportunity to take advantage of the power of new and emerging technologies for widespread improvements in teaching and learning today, tomorrow and far into the future.*

*(Note - the remainder of this report can be found at*

*http://www.ed.gov/Technology/elearning/index.html)*

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# Sidebar: Tools for Developing e-Learning

*Elliott Masie*

**Editors Note:** *Two items of particular interest for Distance Learning practitioners appeared in Dr. Elliott Masie's TechLearn TRENDS #197*

*1.* **Integrate Classrooms into e-Learning Strategy***: In a recent review of several Corporate e-Learning Strategies, we were struck by the absence of the mention of the classroom. While it makes sense that an "e" strategy would focus primarily on the electronic delivery of training resources, the reality in the field is that classrooms are not disappearing (though they are changing their footprint and role) and that an organization cannot afford to have a Learning Strategy AND an e-Learning Strategy without tighter integration. There are key ways in which technology can EXTEND the footprint and impact of the classroom. And, there are similar needs to leverage classrooms, in old and new formats, to EXTEND the power of web delivered training and learning resources. Caution!!!*

*2.* **Results of e-Learning Authoring Survey***: We recently conducted a TechLearn TRENDS and Learning Decisions Survey on e-Learning Authoring tools and approaches. 1,615 responses were recorded the week of January 15th. Here are the results: When a unit of e-Learning content is being developed internally, which tools are you using: (In order of use)**

| *TOOLS USED FOR DEVELOPING e-LEARNING* | *Weighted Score* |
|---|---|
| *Document Creation Tools (e.g. PowerPoint and Word Processing)* | *85** |
| *Web Development Tools (e.g. Dreamweaver or FrontPage)* | *71** |
| *Learning Specific Authoring Tools (e.g. Authorware or Toolbook)* | *52** |
| *Programming Tools (e.g. Visual Basic, C++)* | *47** |
| *Authoring within a Learning Management System (e.g. Blackboard or Learning Space)* | *38* |

*We are tracking a trend towards more and more of e-Learning content being authored with everyday document tools.*

**About the Author:** *Elliott Masie is Director of the Masie Center. He may be reached at <masie@masie.com>. This research is reprinted with permission from Elliott Masie.*

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**Editor's Note:** *This is a thoughtful analysis of the praxis of online learning from the perspective of the online novice instructor. It is a useful tool for first-time online teachers and serves as a benchmark for more experienced online faculty.*

# Developing a Successful Online Class: What Works to Keep the Students Motivated and Interested?

*Barbara Farrell, Ed.D., CPA*

*Online education is a unique and important alternative for many students wishing to continue (or start) their education. Today, online education is part of a new culture with many distinct characteristics. It fills a necessary niche in the changing role of education. Without online education, many adult students with full-time jobs and families would never have the time (or inclination) to continue their studies.*

*Online instruction however, from the instructors standpoint, can be significantly more difficult than instruction in a traditional class. In a traditional class, it becomes quickly evident that you are losing your audience if the entire class is looking out the window. In an online class though, how do you figure out that you have lost your audience? Also, in a traditional class, an instructor will know if the class is confused if (s)he sees a collection of blank stares. Again, how does an online instructor get that same sense?*

*These are just some of the questions many instructors struggle with when considering teaching and developing online classes. The purpose of this article is to share some experiences in developing an online course - what worked, what did not work, what kept students interested, and what were some obstacles to student learning.*

## The Outline or Syllabus

*The first document a student is likely to receive from the instructor is likely to be the syllabus. This will be the document that will guide the online student through the remainder of the class. It should establish course guidelines and provide students with information about the instructor, learning objectives, course expectations, and instructor/institutional policies. One might argue that an outline in a traditional class should also do the same. This is true, however, if the outline is not as inclusive as it should be, the instructor is available in a traditional class during class and office hours to clarify misunderstandings.*

## Elements of a Well-Designed Outline for an Online Course

*First, there needs to be an introduction to the instructor with contact information. Unlike in a traditional class where students can see you and form an opinion immediately based on your appearance, students in the online class need to be able to place a face and a profile with the name. By placing a picture with the outline and sharing some personal information, you are creating a more comfortable atmosphere for the student. No longer will you be Professor Unknown, but rather a professor with a face that has interests and hobbies and maybe even a family too! By doing so you have opened a line of communication that will make the student more comfortable. Contact information is also important just in case a student needs to communicate other than through discussion forums or e-mail. By giving the students phone numbers, the instructor is communicating that (s)he cares about the student and is willing to make themselves available during off-hours. Personally, I make sure I tell students that all communications will be answered within 24 hours of being received.*

*Second, there needs to be a course description. The course description will be the first introduction the student will have to the course. Students will look at the course outline to see what topics will be covered and to see what topics will tweak their personal interests. In a traditional classroom, it is the instructor's task the first day of class to engage the students, and capture their attention, and excite the students for the coming semester. In an online class, this needs to be done through the course description. A well-designed outline needs to generate energy and excitement to motivate students to want to learn.*

*Third, there needs to be a course schedule of assignments. This will allow the online student to plan his (her) work and social schedule accordingly. In addition, the assignment schedule should define deliverables and time frames for those deliverables. For example, if the course is a 15-week course starting on Monday, all class assignments for the week must be completed by Sunday evening at midnight unless the instructor is notified of extenuating circumstances.*

*Fourth, there needs to be a clear description of classroom policies. Included should be: grading policies and weighting of assignments; policy for late submissions of assignments; attendance in online discussions; and participation in online learning experiences such as discussion boards. Course guidelines clearly define for the online student what is most important to the instructor. Therefore if a student's life interferes with school in a particular week, the student will know what is most important to the instructor and what they can let slide for this week.*

*Last, there needs to be a clear disclosure about the institutions policy concerning academic honesty. Plagiarism and cheating is not tolerated in any academic institutions, but a clear policy description of the seriousness of these offenses on the course grade and academic status is necessary.*

### Online Lecture Notes

*In a traditional class, students read the required course material first, listen to the instructor's lecture, take notes, and ask questions if they have any. The lecture has to be stimulating and informative. In a traditional classroom, the instructor is the actor and the classroom is his (her) stage. (S)he performs for the students, hopefully engaging them for the period of time they are in the class and motivating them to continue the pursuit of knowledge outside the* *class. In an online class, the instructor's "stand-up" lecture is replaced by notes. The lecture notes therefore need to be both stimulating and informative thereby replacing instructor. To do this, standard outlines of course materials or PowerPoint presentations are boring, repetitive and likely will not hold a student's interest for too long. Having students nod off after reading a page or two of notes would indicate the presentation was not too interesting. Rather, there needs to be a mix of media within the outline. Course notes, mixed with audio files, video files, links to web pages, and reference notes to the textbook provide diversity for the student and a more interesting delivery.*

*In a traditional classroom, the quality of the lecture depends significantly on the instructor: for example the mood of the instructor, how they are feeling, time pressures to get through the material, and outside distractions in the class. Even though pressures exist in an online environment, students in an online class can control and manage their study time and attention to the lectures at their own pace. By adding a mix of delivery media in the lecture notes, the instructor is adding diversity to keep a students attention and to allow for logical breaks in the students study time.*

*I have also found that lecture notes should be both general course notes and references to specific pages within the textbook. Therefore, if after reading the text the student is not clear on a topic, they can then go to the course notes and read the general notes (similar to a faculty members lecture) and specific examples that are referenced to pages within the text.*

**Setting the Mood for the Class**

*It is important in any class to set the mood initially. However, in an online class, there is no body language or eye contact with the students as there is in a traditional classroom. In an online class, students and faculty rely on the written word. If communication is sterile, students will be intimidated. Since the student's initial experience in the virtual classroom often determines his (her) future success, communication needs to be open, friendly, and responsive.*

*I have also found that adding humor to the online class helps to relax students and make them feel more comfortable. Adding that level of comfort helps students feel more at ease with asking questions, communicating to the instructor, chatting with other students, and working in group projects with others. Humor can warm up an otherwise cold and sterile delivery environment. Humor can bring the instructor and the students together in such a way as to create a positive learning experience. It is important to realize here the difference between humor and sarcasms. In my experience, humor works well, but sarcasm leads the students to believe they too can add their sarcastic comments. Humor puts students at ease but sarcasm makes many students feel uncomfortable.*

**Student Evaluation and Feedback**

*Evaluating students is an important aspect of providing feedback to students. Remember, they do not get to see an instructor weekly. Therefore, many students need to hear from the instructor to make sure the instructor, knows whom they are. I do this several ways.*

*First, a requirement of my courses is student participation in weekly discussion* *boards. Some questions, (never personal), are for the students to answer directly to the instructor. These questions are both about the course material and also more general questions about where students might be encountering difficulties within the chapters. Within the first three weeks of a class, a question I always ask is, "How are you adjusting to being back in college? Are you experiencing time management problems? What are some of the techniques you are using that help you complete your work on time?" I find these kinds of questions allow students to open up, talk to me and share their experiences. I always answer student discussion question comments so they know I have read what they have to say. Students' are graded on their participation in the discussion boards.*

*Second, students have weekly assignments that must be completed. These assignments are graded and are a component of the students' final grade. Students submit these assignments through a drop box. I make a commitment to students that all assignments will be read and graded within 24 hours of being submitted (with weekends being an exception). After reviewing the assignments submitted, I make comments and corrections, and reply to the student via e-mail, my evaluation of their work. A student's grade on the discussion board assignments and on their homework is then entered in the gradebook. Students' have access to their own grades through the course software.*

*Third, quizzes are administered every two or three weeks. The quizzes are multiple-choice questions and are reasonably short (usually 10 questions). Each quiz must be completed within the week the subject material is assigned. After the week is over, the quiz is no longer available. These quizzes give me a sense of whether the student is understanding and completing the material assigned within the time frame required. I send each student a quick e-mail after they complete each quiz commenting on their performance, and asking if they understand the questions that were missed. Again, the course software grades the quizzes, the instructor needs only review the grades and make sure the student knows you are available if they have questions.*

*Finally, every fourth week, students have a final project to complete on the material covered in the three prior weeks. This project is equivalent to a quarterly exam. Students are not permitted to confer on this project, nor can they ask the instructor how to complete a specific task. Students must work on their own, and submit the completed assignments via the drop box by the end of the week. Again, I provide detailed comments on their work and their grade on the assignment via e-mail.*

*Frequent positive feedback is essential in an online classroom. Online students cannot see their instructors. The only way they know the instructor is paying attention and they are performing as expected is through feedback. Regular positive feedback on a timely basis is what makes an online student feel as though they are part of a class and encourages their participation.*

**Conclusion**

*Today, online education is part of the new educational culture. It has its own characteristics, and is filling a niche for many students that otherwise would not be able to attend classes. Numerous colleges and universities throughout the United States are establishing distance education programs.*

*These are just some of the techniques that were used when I developed online classes - what worked, what did not work, what kept students interested, and what were some obstacles to student learning. Online instruction requires interpersonal communication. Some instructors initially believe teaching an online class will be significantly easier as it does not require any "stand-up" classroom lecture time. However, nothing could be farther from the truth. Although different from a traditional class, online classes require as much effort on the part of the instructor and student as traditional classes.*

**Bibliography**

*Burbules, Nicholas C. and Callister, Thomas A.. 2000, "Universities in Transition: The Promise and the Challenge of New Technologies", Teachers College Record Volume 102, Number 2, 2000, p. 271-293.*

*Carr, Sarah. Feb 11, 2000, "As Distance Education Comes of Age, the Challenge Is Keeping the Students", Chronicle of Higher Education.*

*Carr, Sarah. Feb 14, 2000, "Psych Students Learn More Through Distance Ed But Are Less Satisfied", Chronicle of Higher Education.*

*Schweizer, Heidi. 1999. Designing and Teaching an On-line Course, 1st Edition.*

*White, Ken W. and Weight, Bob H. 2000. The Online Teaching Guide, 1st Edition.*

*Young, Jeffrey. March 3, 2000, "Dispatches From Distance Education, Where Class Is Always in Session - Seven students Discuss How They Learn -- and Live -- Through a Regimen of Online Courses", Chronicle of Higher Education.*

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*"It's been a long road back. Doing business in Vietnam," The CPA Journal; New York; Apr 1997; Barbara R Farrell, James R Downing, and Patricia Healy.*

*"The changing role of the auditor: An analysis of viewpoints from the auditors' perspective," The Mid - Atlantic Journal of Business; South Orange; Jun 1998; Barbara Farrell and Joseph Franco.*

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Email comments to the Editor

# The Writings of Guy Bensusan

Many of us have followed the writings of Dr. Guy Bensusan for a long time. Others are just discovering him. He is a frequent contributor to the DEOS listserv, and freely shares his rich experience and philosophy. Over the years, Ed Journal has published a number of his articles. He has given his kind permission to publish these each month starting with his writings of about five years ago.

His philosophy and practice have continued to grow with the advent of new technology and the acceptance of distance learning as a viable and effective alternative to traditional methods of teaching. He is the master teacher, leading us into new paradigms of teaching and learning. Through these writings he will take us on a journey of exploration and discussion. He will show us how to motivate students and achieve results with anywhere-anytime collaborative learning that are the envy of most classroom teachers.

The *Bensusan Method* is enriching the lives of tens of thousands of students. Ed Journal is grateful to have Dr. Bensusan present this series of articles each month so that you, your colleagues, and your students can enjoy and benefit from his experience.

# More than a Tool

*Guy Bensusan*

*Over the past decade or so, ever since technology has, according to some, "raised its dreadful specter over our institutions of higher learning," I have been hearing the same phrases repeatedly:*

*"As professors dedicated to our disciplines and the training of our students, we are philosophically opposed to allowing technology to dictate what we do in our classrooms, and we cannot allow those who push technology to turn us into insignificant servants of the machine.  Technology is just a tool, and tools are intended to be used for the benefit of humankind, meaning that the humans must control the tools and not the other way around."*

*At first glance, this defensive didactic diatribe negatively rejects the use of new* *tools, even though these thoughts do not represent the thinking of a majority of teachers. It elevates pedagogy over andragogy -- that is, the professors refer to disciplines and training and who is in charge of the classroom and who has possession of the students. The phrases above subordinate tools to whatever humans may want to do with them. They elevate anthropocentric "human choosing" to a higher good, thus sounding more like a plea for Renaissance Humanism than a current appeal for rational balance in a forthcoming and complex millennium. Interestingly, what is not mentioned are learning, learners, learner-centeredness or lifelong learning.*

*As one delves further, we find a superb de-construction to play with, dis-assemble, re-construct and learn from, as we have often done in our learning-centered course in Humanities by using The Ladder, The Hexadigm and Bias models, which are described in Chapter A-2. But rather than argue over the various points, attitudes, tautologies and implications, which does not in any way prevent the inexorable and perhaps inevitable evolution of the tools being castigated by traditional teachers, let me instead describe to you my recent journey of discovery into how two-plus-two can produce much more than four.*

*The electronic and cyber technologies have become more than mere tools; by being variously combined, they open new paths to learning in ways that I would otherwise not have been able to explore. An example may serve here, but it will require a bit of background. I have been teaching at Northern Arizona University since 1963, and when I first arrived, my contract stipulated I teach general Humanities courses for a Liberal Studies purpose and History courses for degree programs. The Dean of Continuing Education asked me later on to take those courses off-campus by driving to far-away and culturally different areas of Arizona, where I would teach with Navajo Indians or Borderland Mexican Americans.*

*I experienced two different worlds. On campus in Flagstaff, 7000 feet elevation, at the base of the San Francisco peaks towering a mile above us and surrounded by Ponderosa Pines for miles in every direction, we were a small state university in a non-metropolitan area, highly multicultural in our student body, coming from all over the US as well as from overseas, though less multicultural in our faculty. We were more remote from big-bad-city problems, feeling the effects of the Sixties even less profound than elsewhere.*

*As I looked into the multicultural faces in my courses, and being a foreigner and international student myself (despite naturalization), I had no difficulty in finding ways to use the students' cultural diversity to illustrate ideas and realities in our humanities and history courses. It naturally meant that I needed to know students individually and where they were from, although it was not all that simple, as they usually tried to blend together into the commonality of dress, and college life.*

*In my efforts to teach courses about the evolution of the Southwest or Mexico, I could have focused only on information, but I had the good fortune to find in the classroom descendants of Indians, Hispanics, Blacks (as then called), plus Mormons, Pioneers, Miners, Ranchers, Cowboys, Sheepherders, Loggers, Scientists, Freighters and Railroaders. These people and the experiences of their predecessors were a wonderful resource and we put it to use productively in our discussions about centuries of cultural evolution along our Greater Southwest Border. The learning principle was that the course would be about* *past information, but also involved perceiving it through the various eyes of those who participated: winner, loser, bystander, latecomer, historian, worker, man, woman.*

*At the same time, with my off-campus teaching, I traveled into places where the students were rather more "monolithic" than heterogeneous. When I taught Humanities courses at centers on the Navajo Reservation, for instance, I would drive two hundred miles to a small school in a quiet, colorful sandstone local, at a crossroads with one gas station and some hogans, where all the students were culturally traditional Navajo. When I taught in the mining area in the mountains southeast of Phoenix, I would drive two hundred miles in the opposite direction to interact with small-town students whose livelihoods depended upon the mines; their longstanding historical traditions derived from Spanish and Mexican times, as well as from more recent Anglo developments and modernizations.*

*Yet another divergence was when I taught in the Mormon ranching and logging areas of the Eastern Arizona mountains, or in small towns three hundred miles to the south along the border with Mexico. The diversity of the Flagstaff classroom was not found in these separate locales; the relative homogeneity of perceptions and attitudes, so different from what I was used to on the main campus, did not help me in my effort to extract multicultural perspectives from the students as we studied our arts and cultures subject. This, of course, did not mean that these students were not diverse within their own confines, or that they were any less capable and creative, but rather that their geographic and economic surroundings and essential cohesion put them in a different vantage point.*

*While these contrasts of ideas added greatly to my teaching experience and were helpful to my growth in awareness about the need to help students examine their own biases as they examined subject matter, and while I could make references from the podium to the diversity of opinions and analyses of topic which occurred elsewhere, my ability to explicate bias diversity to the students was actually just one more dumping of stuff upon them by their teacher. They could intellectualize about multiplicity and diversity, but it was not what they were themselves experiencing. I dearly wished that I could have created and taught a course that would allow us to enter into the vast variety of cultures in Arizona by putting everyone on a bus and using the bus as the classroom, similar to what we did with Semester at Sea. Actually, I offered this concept as a university proposal, discussing it with several people in different administrative positions, but while we all talked about what a great idea it was, it never got off the ground.*

*Then, along came television, Interactive Television! The tables were turned! Instead of students coming to us as regional individuals who lose their regional discernibility in the "uniformitizing" classroom, and instead of us taking a bus to visit regional sites in successive sequence, a fresh and unconventional perception arose from interactive television and "split" technologies. We could all come together on the screen, meeting each other in a manner that still kept us separate in our distinguishable ways. The huge television screen could be divided into rectangles, each of which held a classroom. At first we had two, then we went to the four or Quad-split, and on to the Nine or Nano-split and who knows how many we may eventually be able to encompass as we go onto wall screens and other new technologies?*

*In other words, as a result of building our NAUNet microwave circuit from Flagstaff to a hub in Phoenix and then to distant Yuma and back by five hops from tower to tower, we created a situation whereby those students no longer had to come to Flagstaff nor did I have to travel to their classroom. The students could remain where they were, in their local classroom, a short drive from their homes or work, and so could I. As we added other sites to Kingman, a town one hundred fifty miles west of Flagstaff, and to Holbrook, one hundred miles east, we achieved much more than a bigger audience of NAU students for the traditional talking-head teacher to transfer his or her information to. It was an "interactive" technology; we called it Interactive Instructional Television (IITV). It was now possible for us to accommodate many groups of persons who could talk with each other over great distances, contributing in the process their own cultural information, one to another and site to site.*

*I was both intrigued and challenged by the potential. Teaching as well as taking an IITV course required a different set of skills, starting ideally with the paradigm shift of learning being more central than delivering information. This meant I now had to design a different set of principles upon which to formulate my courses. It meant I had to set aside what I had previously done and come up with consolidating principles which the students could learn and apply them to the information which I previously had lectured about. It meant I had to transfer my course content information to them before class.*

*Almost instinctively I knew in general what had to be done and how I should do it, but the specifics were less clear and besides, one cannot turn everything over at once. The transformation process took several years and many details had to be worked out. But I kept learning new things by simply doing them, while my wife, Gwendolyn, intrinsically a part of the whole process, helped me to establish, subdivide, construct and then turn into colorful visual form the many classroom principles and tools which came to be the perpetual decor at the front of the classroom. These are described in Chapter A-2.*

*Much of this formulation took place during 1994 and 1995, after I had spent five years in this new way of helping learners through interaction. Since then we have added more and more classroom sites to NAUNet. We expect to have twenty-seven of these at the end of 1997, and for the Spring 1997 course in Southwest Arts and Culture, we will be linked to fifteen classrooms around the state at the same time: all of them visible by all students at all sites and at all times (the many spirits being willing, of course, and also if debilitating lightning strikes do not disable our towers! -- another subject for a different book).*

*How does this innovation of fifteen simultaneous classrooms on-line open up new paths to learning? Most states contain ethnic or cultural varieties from French and Spanish to Swedish, Thai, Chinese, and so on with which to enrich learning capabilities. In our large state of Arizona, the fifteen classrooms are spread out from border to border, East and West, North and South. Some are near Mexico, others along the Colorado River, yet others in the high mountains. Some are mining towns, agricultural areas or agrarian, others are retirement havens and resort areas. No two communities in this array have exactly the same cultural, social or economic conditions, while their flora, fauna, weather, access and ethnic concentrations and ratios are just as highly diverse.*

*This is a genuine bonanza, an Eldorado for a creative teacher! Pick a field -- how about botany? Let us create a botany course using the resources that are located at each of the classroom sites. Yuma is in a xerophytic desert, almost at sea level. There are palm trees and cacti, transplanted eucalyptus and poplars and creosote bushes. Tucson, at two thousand feet is a higher desert, with some similar plants but many others, such as Saguaros, growing at higher elevations. With each ascent from four thousand to seven thousand feet we gain a different assortment of plants and trees. Temperatures drop as altitude increases, making life in mountainous Flagstaff distinctly different than that in near-tropical Yuma or the central desert around Phoenix.*

*Imagine how a learner-centered teacher can put such botanical diversity to use, so that the students may seek out and learn from resources in their respective communities, serving as teaching aides or helpers by taking photos and bringing them into class to show to other sites on the television's pad camera. They can also bring in botanical or geological examples or historical artifacts to share via TV with all classrooms. These can be compared with those from other places, making direct juxtapositions possible with the technology of split screen viewing. The effects of elevation, rainfall, location, weather, geology and their impact on plant life can all be demonstrated and compared to all classrooms at once.*

*As a teacher, if you had wanted to offer all this information to all the students before television was available, what would you have had to do? It would require countless miles of travel to all parts of the state, extraordinary amounts of time and money, collecting, research, and recording -- to say nothing of the preservation needed to bring in fresh plants and other botanica for demonstration. Contrast the difference in the professor's conveyance of the information when each piece must be handed around in a class or held up at the front of the room for everyone to see. How much better is the view on a big screen television with zoom lenses and spotlighting; everyone sees the same thing at the same time for as long as is necessary for learning. The subject is up close, easily manipulated, and quickly exchanged for a higher variety or quantity of examples.*

*Many other subjects can be handled in the same fashion in the natural sciences, social sciences, humanities and other fields of study, anything where geographical differentiation is significant to the study of the subject. For example, Arizona has twenty-two Indian tribes, one or more of which are near each classroom site. Consider the possibilities for the Anthropologist, the Socio-Linguistics Investigator, the Dance Historian, or the Researcher into Native Wedding Ceremonies or other rites of passage. Consider the cross-field possibility of team-teaching between, for instance, an Archaeo-Astronomer and a Professor of Indian Literature specializing in Sky Myths or Creation Myths. Or comparing and contrasting Native ways of healing, interrelating them with how mainstream medicine believes various maladies should be treated. The possibilities are endless.*

*For my own venture into this, I plan to create a basic Theme and Variation approach to Arizona Arts and Culture by focusing on four different areas: painting, architecture, museums, and Chambers of Commerce in the fifteen different sites. My job as professor will be to provide some overall views about how the art of painting in its various forms evolved in Arizona over the centuries, with the varying influences from the pre-Conquest era, changes brought in by Spain, adaptations by local artists in regional diversity, the new* *influences of Mexican nationalism, the arrival of Anglo Romanticism, Naturalism, Realism and Modernism, plus the ethnic revivals, current contemporary styles and other influences of today -- more or less as it would be presented in a textbook.*

*At the same time, I will ask students at each site to visit local galleries and painters and see what is to be found in their community. The students will take the over-all theme from what I have presented and shown, and then compare and contrast with what they have found in the locales where they have gathered examples. From these interactions, in which we are all fellow-learners (since students will be showing me things I will not have previously known that locals are already well-aware of), there will emerge a rather new vision of the topic, in far greater detail than might be found in a textbook, and of far more profound worth as learning than anything I could do alone.*

*I plan a similar approach with other topics. In architecture, for instance, it will be possible to compare buildings from all of the historical periods in an overall generalization, while each community will be focused upon one or two periods, which will not be the same as those visible in other locations. Moreover, especially in the days before electricity and air- conditioning, the methods, styles and approaches to architecture took into consideration significant matters of geography, climate, temperatures, rain or the lack of it, and so forth. Actually, we will probably learn more about the land and how people related to it from our architectural study than from painting. This will lead to other conclusions in the course.*

*Museums, the third area, will take us in another direction, since museums tend to reflect both the general approach to museology of the era and also the specific community image selectivity that the contributors to the museum wish to accentuate. There will be the matters of funding, organization, leadership, decision-making, training for docents, and how the board of directors wants the emphasis to be presented to the public. My job here would be to describe some of the history of museums in formulating the imagery and stereotypy about Indians and the Southwest, the influence of the Smithsonian and its precepts, the rise of emphasis on Pioneers, Ethnic Groups, Economic Developments (such as mining and cattle), as well as the influence of tourism upon the development of parks, national, state, community and private -- to which one must add, Tribal.*

*Finally, the fourth section, involving Chambers of Commerce and Tourist Bureaus will continue the same pattern, with my emphasis being statewide and reflecting influences from the national and regional pictures. Students, on the other hand, will have direct contact with their local groups and can bring to class brochures and other paraphernalia calculated to attract people to town: where they will eat, sleep, buy things and visit local attractions. This clearly varies from one community to another among the fifteen, as some rely extensively on "snow birds" or winter visitors, others on cross-border traffic with Mexico, also influenced by the dollar-peso exchange rate and the ease or difficulty of getting across, and yet others creating special pageants and shows to attract large numbers. From the Indian perspective, in many towns Tribal Gaming Casinos are a provocative and competitive feature, considered by non-Indians to be taking money away from them.*

*There should be plenty to discuss and learn from each other, but the most* *important aspect I am seeking is how the total cooperation between teacher and students is going to work as I travel to each site for a week in order that all students will have equal access to me, and so that I can be on hand for their questions in formulating the research design and follow-up, as well as advising on their assignments. I am also looking forward to the use of our cameras in ways that will let us know through juxtaposition on the screen just where each group of people is located and what their surroundings are. All we have to do is train our cameras out the window of the classroom to be able to contrast the several inches of snow in Flagstaff with the orange and yellow citrus on the trees in Yuma! With all the other sites in-between it should be an interesting application of our new tool of electronic wizardry, Interactive Instructional Television.*

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EDUCATION ed AT A DISTANCE

# Ed at a Distance

Magazine and Ed Journal

May 2001 Vol. 15 : No. 5





Email comments to the Editor

## 2001 Calendar

| ISSUE | EDITORIAL FOCUS | FORMAT | EDITORIAL DEADLINE | ADVERTISING DEADLINE |
|---|---|---|---|---|
| *May* | *State, Interstate and Global Distance Learning Networks: Video and Internet* | *Online* | *April 9* | *April 13* |
| *June* | *Learning at a Distance from the Viewpoint of Teachers and Students* | *Online* | *May 7* | *May 11* |
| *July* | *Internet Sampler and Primer* | *Online* | *June 4* | *June 8* |
| *August* | *Distance Learning in Business and Industry* | *Online* | *July 9* | *July 13* |
| *September* | *USDLA Annual Report* | *Online* | *August 6* | *August 10* |
| *October* | *Courses and Courseware for Training and Education* | *Online* | *September 3* | *September 7* |
| *November* | *Overview - National Trends in Distance Learning* | *Online* | *October 8* | *October 12* |
| *December* | *USDLA FISCAL YEAR 2001 ACCOMPLISHMENTS* | *Online* | *November 5* | *November 9* |

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**THE STATE EXCHANGE**

*State Chapters and individuals are encouraged to share information about current activities, proposed legislation, successes and caveats experienced by members of USDLA State Chapters. This will be published in a section of the USDLA web page called THE STATE EXCHANGE. Readers who are not members of State or National USDLA are also encouraged to contribute.*

**TECHNOLOGY EDUCATION EXCHANGE**

*This section will highlight existing and proposed new partnerships and models for active collaboration between communications industries and education, local, state, or national, K-graduate school. It will reference new technologies that hold exceptional promise in meeting the needs of school and training environments. If you are working with technologies that you would like us to review for inclusion in TECHNOLOGY EDUCATION EXCHANGE, either as a manufacturer or user, please send information and press releases to the address above.*

**CALL FOR PAPERS**

*These official publications of the United States Distance Learning Association are interested in research, studies, policy frameworks and analysis in the areas of electronically-mediated distance learning and teaching, curriculum design, distance learning technology, administration of distance education, and related policy and institutional change. ED Journal is a refereed journal published online monthly. Ed Magazine is directed towards exchange of information, new technologies and a more general approach to Distance and Open learning. An interdisciplinary panel specializing in distance education will review all submissions.*

**Submission**
*Article submissions are usually from 2,000 to 5,000 words in length. However, 12,000 word articles based on extensive research, in-depth studies or literature surveys are often published. The material submitted should conform to APA standards.*

*If possible, include camera-ready art or high quality laser prints of all charts and graphs. It may be possible to recreate the charts if necessary from data submitted. Photos may be used if it is possible to incorporate them within the online publication. It is possible to fax in graphs to be re-created by our graphic artist. If you wish to include pictures/photos, please submit a print via EMAIL using .BMP or TIF.*

*An article may be submitted in electronic form, either by online file transfer (email or attachment) or by disk in ASCII Text, Rich Text Format, or as a Word file. Please send one printed copy with the disk.*
*Please include a brief biography of the author or authors, mailing addresses, and email/phone contact numbers.*



Email comments to the Editor

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