

BENCHMARKS FOR A SUCCESSFUL INTERNET  
DELIVERED COURSE AT OKLAHOMA STATE  
UNIVERSITY-OKLAHOMA CITY

By

MICHAEL LEE DELONG

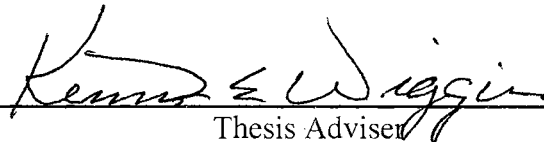
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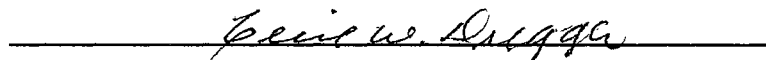
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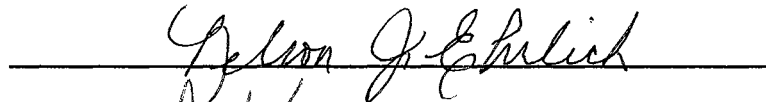
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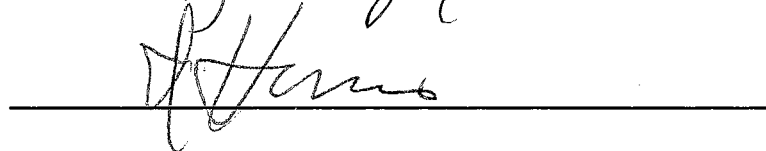
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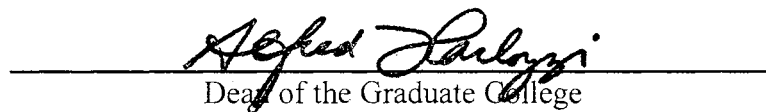
Thesis Approved:

  
Thesis Adviser







  
Dean of the Graduate College

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## CHAPTER I

### INTRODUCTION

#### Background

As the Informational Age and the corresponding new technological era explodes into the 21<sup>st</sup> century, it brings with it an awe that many of us only dreamed about through our science fiction books and magazines, television shows, and movies. Technology is advancing the human senses as well as the mind: automobiles that talk and give their precise location on Earth, surgeons that can operate on a patient from remote locations, household appliances that can be called via phone and instructed to start dinner or make coffee. If all of this is available to make our lives easier and more rewarding, why should the way we educate not also change? Like all other facets of human existence, education is also being carried into the New World by this technological shockwave but, as usual, kicking and screaming. The face of education is changing. Emphasis on education continues to shift from teaching to learning, while the role of the teacher moves from instructor to facilitator. We not only have access to the accumulation of human knowledge, but we can go “on-line” and take part in classes from the philosophers, researchers, and practitioners who attributed to this knowledge. The old paradigm of on-site versus distant learning is blurring as the increasing availability of network resources, modem technology, and software stimulates a convergence of education and technology.



It is estimated that one million students nationwide are taking virtual college courses and the number will double in the next two years (Howd, 2000). According to the International Data Corporation, web-based training was only a \$300 million industry in 1997, but will exceed \$5.5 billion by 2002 (Howd, 2000).

Traditional education is normally received either in the classroom or at some other locale through an instructor, personal tutor, or correspondence. Because of the various technologies available today, physical space, pen and paper no longer limit us. Not only can instruction come from conventional teacher/classroom means, but it can also come in the form of satellite downlink, cable/network feeds, CBT, CD-ROM or the Internet. Students are no longer tied to the more traditional classroom settings. In fact, they can now be anywhere in the world.

This paper will address the attributes of a successful Internet delivered course. More and more educational institutions are now offering credit and noncredit courses delivered virtually via the Internet's World Wide Web. There are classes taught through electronic mail (e-mail), lectured live via chat software, web-based asynchronous, and web-based interactive. The rate at which higher education is utilizing these unique methods of delivering education is growing dramatically. Their apparent ease of use, availability and student centered delivery are driving a shift in focus away from more traditional education.

### The Problem

Even though Internet delivered courses, credit and noncredit, are growing in popularity, there is concern on what constitutes a good course. There are so many ways a

course can be taught utilizing the resources of the web, there is a need to identify which methodologies work best and to determine successful benchmarks.

#### Purpose of the Study

Because of the growing popularity of the Internet as an educational delivery vehicle of choice among higher educational institutions, a determination needs to be made on which methodology works best and finally, the benchmarks for a good, Internet-based course at Oklahoma State University-Oklahoma City. This study focused on courses that are offered totally over the Internet through the World Wide Web.

#### Objectives of the Study

The objective of this study was to develop a baseline or benchmark of attributes that constitutes a “successful” Internet delivered course.

#### Significance of the Study

Because of the increased rate the Internet is being utilized for the delivery of instruction, a determination of what constitutes a viable web-based course should be ascertained. Colleges and universities are delivering classes as well as degree programs over the Internet and “Virtual Universities” are becoming more prevalent every day (Mather, 1997). For instance, The Western Governors University, a consortium of several western states including Oklahoma, started offering courses in the fall of 1998. A consortium of community colleges in Oklahoma has also begun the planning stages of what is referred to as “ECCO,” The Electronic Community College of Oklahoma.

Whether through peer pressure or market demands, higher education has now begun the journey into cyberspace, but there is still some uncertainty as to whether the recipients of this alternative delivery system will receive a “quality” education and be marketable in their chosen profession. There are so many different methodologies and companies selling those methodologies available to colleges today that choosing one can equate to buying a new car.

### Definition of Terms

The following terms are associated with the Internet and the World Wide Web:

Asymmetrical Digital Subscriber Line (ADSL) – A connection to the Internet via dedicated telephone lines. ADSL allows high bandwidth, high speed transfer of data.

Asynchronous – When training is not in real time; usually a self-study mode.

Authoring – Software for developing an interactive program.

Bandwidth – The capacity of a data connection or network, measured in bits per second (BPS) digital transmission, or cycles per second (hertz) for analog transmissions. It is analogous to the number of lanes on a highway, or the diameter of a water pipe.

Benchmarking – A process that helps one learn from the best practices of others who are doing similar work, by comparing and contrasting efforts.

Chat Room – A virtual room for text conversation in cyberspace. In other words, in areas in online services (like AOL) and other Web-like networks in which multiple users can simultaneously converse by typing text into their computers through a software browser.

Distance Learning – A learning process meeting three criteria: a geographical distance separates communication between the trainer and participant; the communication is two-way and interactive; and some form of technology is used to facilitate the learning process.

Dynamic HTML – A collective term for combination of new Hypertext Markup Language (HTML) tags, style sheets, and programming that allow animation and event-driven activities.

Interactivity – The means by which a user is engaged with the content of a course, typically used as a tool to ensure learning occurs.

Internet – The world-wide network that is a collection of smaller interconnected networks.

Internet Service Provider (ISP) – A vendor that provides Internet connectivity to the public.

Modem – Stands for Modulate/Demodulate. A piece of equipment that connects a computer (digital) to a communications line (analog) such as a telephone line. Most users have modems capable of transmission speeds of 2400 bps to 56,000 bps.

Multimedia – The integration of at least two of information types for presentation on a television, computer screen or other computer-driven device with a screen interface. Multimedia can consist of audio, text, graphics, animation or video.

Online – A computer that is connected through a modem or network to another computer or network (such as the Internet) to exchange information or data.

Plug-ins – Small software that can be downloaded by the user to enhance the capabilities of the browser to play audio, video, or some other multimedia component.

Virtual University – Credit and noncredit courses offered online utilizing the Internet as the delivery vehicle (usually through the World Wide Web) by an institution of higher education or a consortium of interested partners such as the Western Governors Virtual University.

World Wide Web – Currently, the most popular part of the Internet that enables multimedia browsing, that is sounds, graphics, pictures, animation.

### Scope and Limitations

The study will gather information from a variety of sources: books, papers, articles, and course databases to determine what constitutes a good on-line course. This study will focus on courses being offered over the World Wide Web.

The main limitation to this study is the relative “newness” of the Internet as an instructional vehicle. Because of this, data may not be available in the quantities necessary to make an accurate judgment.

### Outline of Work

This study will be conducted utilizing related books, periodicals, articles and databases. Information will be gathered on the attributes of an educationally viable and easy to navigate on-line course. This information will be utilized to build a definitive infrastructure that will allow others to build their own course with the right attributes or to select a packaged solution from a vendor.

## CHAPTER II

### REVIEW OF THE LITERATURE

#### The Traditional Model Versus Distance Learning

The traditional model of education has always been teacher/textbook/student oriented. The teacher was the provider of knowledge and the student with the textbook as reference and guide would learn or not learn the concepts put forth. The focus was usually not on the student. Technology was eventually used in conventional instruction, but just to augment the information provided. Computers would just assist in the visualization of complicated concepts and allow the students to interact with data and information. Education more or less grafted technology into preexisting structures and pedagogy but delivery remained traditional teacher/textbook/student focused.

Wheeler (2000) introduces a point to consider when he describes a traditional classroom environment as a place to chat with fellow students and trying to anticipate what the teacher will do. He equates a classroom to a two-lane country road. It offers a feast for the eye, nice views, villages, farms, twists, crazy turns and often, lots of excitement (Wheeler, 2000). E-learning is more like an interstate highway, straight, true, passing through unvaried terrain and sometimes boring (Wheeler, 2000).

Phoha (1999) also feels that there many pros to the traditional classroom versus classes offered through e-mail, (one distance education component) and questions

whether the student is receiving a proper education and whether degrees through web or e-mail are offered simply to increase enrollment. In Phoha's (1999) view, the quality of education is compromised for the following reasons:

- Teaching (and learning) is a dynamic process. A teacher uses facial expressions, hand gestures, and a variety of other aural and visual cues and feedback from a class to set teaching pace and style. This is not possible using e-mail.
- The present state of technology (even with a high degree of video quality) cannot effectively support audio/video Internet transactions in real time when the students have at the most a 56Kbps modem. This situation will improve when increased bandwidth capacity makes affordable audio/video transmission possible, but is currently a limiting factor.
- Presently, there is not enough standardization in e-mail packages. Responses to e-mail structured and formatted in a particular fashion in one e-mail application might appear differently when received and viewed in another.
- Learning styles differ. Some students are visual learners others need special one-on-one instruction. This is not possible with e-mail.
- There are no checks and balances to ensure that work submitted via e-mail is the enrolled student's and not somebody else's. (p.29)

Phoha makes a strong point about using e-mail exclusively in the teaching environment, but distance education courses have made dramatic improvements even from a year ago. What differentiates today's distance education arena is the level of

interaction; the presentation of the material, and the pace that is usually set by the teacher, not the student, however, the student still has a choice.

According to Baker, Friesbie, and Patrick (1989), distance education can be divided into two distinct categories: correspondence-based and telecommunications-based distance education.

In correspondence-based distance education, the education process is more traditionally based. It tends to be more individually oriented since contact between the students taking the course is virtually non-existent. Correspondence-based distance education primarily includes learning material by print, which are sometimes supported by radio, television, audiotapes, videotapes, computer-based and computer conferencing. It targets individual learners instead of groups. The learner pursues his or her learning independently, usually at a time and place convenient for the student. Instruction is not live, so the student cannot interact with an instructor until after the instruction has been presented. This interaction can be in the form of mail, e-mail, telephone or other communication mediums (Baker, Friesbe, & Patrick, 1989). It is common for this style of distance education to have little or no interaction between the student and instructor except for possible comments on returned, graded assignments.

### Print-Based

Keegan (1983), Gray (1988), and Moore and Kearsley (1996) state that most distance education programs are accompanied by some kind of print regardless of the associated media, unless there is a literacy issue (Keegan, 1983). Usually, this form of print-based instruction is called correspondence, home study or independent study



(Moore & Kearsley, 1996). There is virtually no interaction between the student and the instructor, and when there is, it is by mail (Moore & Kearsley, 1996).

### Audio-Based

This medium normally consists of printed materials and accompanied instruction transmitted by radio or delivered by audiocassette (Keegan, 1983; Gray, 1988). Radio is a cost-effective means of instruction and can be transmitted over large distances to a large audience. However, according to Bates (1995), the major weakness in this type of medium is the difficulty a student may have in being available at the time of broadcast.

Audiocassette is perhaps the most cost-effective means of delivery (Bates, 1995). It is also independent of time and allows the student to learn according to his or her own schedule.

### Video-Based

This form of distance education usually utilizes some form of videocassette, supplemented by printed materials (Keegan, 1983). The video either accompanies the printed materials or is broadcast over television. Educational television has been around since approximately 1934 and has become a viable means of delivering all levels of education (Moore & Kearsley, 1996).

### Cable Television

According to Moore and Kearley (1996), cable television started in 1952. In this mode of delivery, a local distribution facility is linked to national networks via satellite

(Bates, 1995). Signals are then sent to television sets through fiber-optic or coaxial cable. The student views the program at home and calls the instructor should they have any questions (Moore & Kearsley, 1996).

### Computer-Based

This supplemental form of correspondence-based distance education usually takes the form of a CD-ROM or floppy disk that the student uses in conjunction with the printed material or as a stand-alone delivery mode. The basic premise of this mode of delivery is that the student still works alone (Moore & Kearsley, 1996). The student still maintains the normal interaction associated with correspondence-based study. CD-ROM has become increasingly popular due to its multimedia capabilities, but is relatively expensive to produce (Moore & Kearsley, 1996). An increasingly popular form of computer-based education is audio and video streaming. Streaming consists of the simultaneous transfer and display of sound and images on the World Wide Web while the student watches and listens to these files as they are being sent to the browser by a server (DeVeaux, 2000). The older methodology of sending video and audio consisted of waiting for the files to completely download to a computer before they could be viewed (DeVeaux, 2000). Streaming allows instructors to tape lectures or any other event and post them to a website for viewing by students.

### Computer Conferencing

Utilizing a telephone /cable modem line, and a computer, students can connect to a computer server and access information placed by their instructor at their leisure

(Moore & Kearsley, 1996). The information can be stored in the form of a web site or a dial-in server.

In telecommunication-based distance education, the student is usually exposed to a live, simultaneous transmission of instruction from a classroom or studio from a distant site (Baker, Friesbie, & Patrick, 1989). In this delivery medium, the instructional focus shifts from the individual to a group. These groups do not even have to be in the same room. Current technology allows a variety of locations to be connected together and share the same instructor in real-time (Baker, Friesbie, & Patrick, 1989). This mode allows real-time interaction between the students and instructor. It is the closest delivery medium to traditional classroom instruction according to Baker, Friesbie, and Patrick (1989).

There are various types of telecommunications-based distance education. All of them have various degrees of interaction between the student and instructor (Gray, 1988). The types are teleconferencing, audioconferencing, audiographics, and videoconferencing.

### Teleconferencing

According to Omatseye (1999), as educators explore new ways of making education available to the growing number of learners across the country, two-way interactive television has received considerable attention. There are several benefits to this delivery mode, one which is cost benefit. Omatseye (1999) states that teleconferencing:

- Provides equity and increases the quality of educational opportunity for learners in remote areas.
- Provides access to subject matter experts or career role models not available in the local community.
- Provides increased access to information and instructional resources for learning everywhere.
- Provides interactions and opportunity for joint activities with students in other schools and locations.
- Provides opportunities for staff development and in-service training for beneficiaries.
- Promotes school/community linkages.
- Cuts down on travel and other costs to beneficiaries.

In a survey of a graduate course at the Kentucky Tele-linking Network, 70% of 40 students expressed satisfaction in (Omatseye, 1999):

- Learning to use state of the art equipment.
- Interactivity.
- The ability to get a variety of ideas from different areas of the state.
- Teaming with other students on projects.
- Having accessibility to instructor through phone, fax, e-mail or “on air.”
- The short travel time to sites from home.
- Networking with other students and faculty.
- Small classes and small groups.
- No Friday classes.

On the other side, 30% of the students stated that:

- It was hard to get test results back.
- It was difficult to have one-on-one interaction with the instructor.
- It was hard to adjust to use of a microphone while a camera is pointed at them.
- It is too impersonal.
- They were bored watching the television the entire class time.
- Slow paced.
- There was too much time spent moving from site to site.
- There was a lack of availability of instructors except at class time.

One can see that there are pros and cons to this mode of delivery, but if organized and conducted properly, these courses are a viable alternative to traditional classroom education.

### Audioconferencing

This mode of delivery consists of teaching with audio equipment (speakers and a microphone). The instructor can bring students together from various sites using a telephone or speakerphone depending on the size of the group (Moore & Kearsley, 1996).

### Audiographics

This involves connecting groups of students using computers and an electronic board for the instructor to display images (Kinyanjui & Morton, 1992). The board can also deliver audio and other objects that the instructor wants.

## Videoconferencing

Hyman (1999) explains videoconferencing as a technology that connects two or more people at different locations together so they can see and hear each other at the same time, even sharing computer applications for collaboration. Placing a video call is much like placing phone call. After the connection is established, you see the other person (or persons) in color video. The visual connection and interaction enhances understanding and helps participants feel connected to each other (Hyman, 1999). This goes a long way toward building relationships that e-mail, telephone, and on-line chat cannot.

Videoconferencing can improve retention and appeal to a variety of learning styles by including diverse media such as video or audio clips, graphics, animations, and computer applications (Hyman, 1999).

A videoconferencing system must have audio-visual equipment, usually a monitor, camera, microphone, speaker, and a means of transmitting information between the sites (Hyman, 1999). A broadband satellite connection with studio-quality equipment produces excellent full motion video, but this method is very expensive.

An alternative to using the more expensive satellite or television broadcast connection is the Internet. There are currently several means of videoconferencing over the Internet. The H.320 standard is based on compression and decompression (CODEC) for audio and video (Mehta & Dunn, 1995). There are still a considerable number of businesses and higher educational institutions utilizing this standard, but the newer H.323 standard is rapidly becoming the favorite. The H.323 protocol was created to operate with networks that cannot guarantee quality of service (QOS) (Harbison, 1999). In other

words, networks utilizing the older standards usually received jerky and often times, dysfunctional video. The new standard (or protocol) was created to help alleviate this (Ohr, 1997).

According to Heterick (1996),

The debate over the value of information technology in learning within our institutions of higher education increasingly pits those who believe the historic paradigm of verbal dialogue between teacher and student is optimal against those who would try new strategies focused on learning rather than teaching. (On-line, para. 1)

Teaching on the Internet is a model that places the learner in the center of the teaching and learning enterprise. It places instructional text, the instructors, and a technology-mediated learning environment at the disposal of the students. A technology-mediated learning environment is a system that allows students to go through a course at their own pace, at their own schedule, in accordance with their own diagnosed learning needs. It incorporates a learning management system and continuous real-time evaluation. The student's own learning drives the system and makes the instructor aware of acceleration or retardation. Traditional value does not mean technology assisted eye-candy, but learner centered, technology-mediated learning.

According to Heterick (1996),

To hear some in our community tell it, information technology not only signals the decline of learning, but perhaps the end of civilization as we have come to know it. It has always seemed paradoxical that so many folks in the academy who spend their lives learning through their research and scholarly pursuits, without the aid of classroom lectures, somehow feel that the only way everyone else can learn is in the classroom listening to lectures. It is more than a little ironic that we hear similar comments regarding the historic paradigm of the academic library.

Our historic compromises and the surrogates they spawned—the classroom lecture and the central book repository—have become so ingrained in our way of thinking that some can't imagine a world without

them. What if, to begin with, books had been inexpensive and universally available and television had been invented by Plato? Would we still have created libraries as physical repositories and built educational institutions around them? Would the classroom lecture be the standard method of learning? (On-line, para. 6-7)

The world is in the midst of a Copernican revolution. Just as Copernicus redefined astronomy by positing that the earth circles around the sun, and not the other way around, so the new educational theory suggests that the generation of knowledge must be pegged to the conditions of the learner, rather than the genius of the instructor. The revolution is about learning, not about teaching (Raschke, 1999)

### The History of Distance Education

To properly grasp the basis of web-based education, one must first understand what distance education is. The origins of distance education are attributed to Sir Issac Pitman, the English inventor of shorthand. In 1840, he developed the idea of delivering instruction via correspondence courses by mail. Even at this time, the idea was so popular that he began sending courses to individuals in the United Kingdom, Germany, the United States and Japan. By the 1900s the first department of correspondence was established at the University of Chicago (Matthews, 1999). In 1969, the Open University (OU) marked a significant development in distance education by initiating a second phase to the traditional correspondence program (Matthews, 1999). This second phase was the use of a mixed-media approach to teaching. Besides the usual correspondent lessons, a mixture of structured texts, audio and video materials were packaged and even sometimes supplemented with television and radio. Tutors were also assigned that tutored over the telephone and held group meetings on the weekends. Because of the success of this new



format, distance education became a viable means of obtaining an education and brought it more to the center stage in higher education (Matthews, 1999). At about the same time, satellites were starting to move from the government and military arena to the commercial. PEACENET in the Pacific Basin was founded in 1971 and used in the first application of satellites in distance education (Matthews, 1999). In the two decades that followed the opening of the Open University, four more open universities were established in Europe and more than 20 were established in other countries around the world. In the United States, by the mid-1980s, more than 300,000 students were enrolled in university taught distance education courses. In Canada, 19 more traditional universities were active in distance education. In the former German Democratic Republic, approximately one quarter of the university and technical college graduates attained their qualifications by distance education (Matthews, 1999). In 1994, the OU had more than 200,000 students enrolled in distance education courses in Russia, Hungary, the Czech and Slovak republics, Bulgaria, and Romania. In a lot of cases, the student population in these distance education programs far exceeds those in more traditional universities. A majority of higher education institutions in the United States have some kind of distance education program (Boettcher, 2000). According to the United States Department of Education, about a quarter of the U.S. institutions that offered distance education courses in the fall of 1995 offered degrees that students could complete by taking distance education courses. There were an estimated 690 degrees and 170 certificates. It is estimated in the 1998-1999 academic year, 58% of higher education institutions in the United States offered some kind of distance education program. More and more are offering degrees or certificates through this medium.

Figure 1 depicts the number and percentage distribution of 2-year and 4-year post-secondary education institutions that offered distance education courses in 1997-98, that planned to offer them in the next 3 years, and that did not offer and did not plan to offer them in the next 3 years, by institutional characteristics.

Institutional characteristic	Total number of institutions	Offered distance education in 1997-98		Planned to offer distance education in the next 3 years		Did not offer in 1997-98 and did not plan to offer in the next 3 years	
		Number	Present	Number	Present	Number	Present
All institutions	5,010	1,680	34	990	20	2,340	47
<b>Institutional type</b>							
Public 2-year	1,230	760	62	250	20	230	18
Private 2-year	1,120	60	5	220	20	840	75
Public 4-year	610	480	78	70	12	60	10
Private 4-year	2,050	390	19	450	22	1,210	59
<b>Size of institution</b>							
Less than 3,000	3,800	730	19	840	22	2,230	59
3,000 to 9,999	820	610	75	110	14	90	12
10,000 or more	400	350	87	30	8	20	5

Figure 1. Distance Education Courses Offered in 1997-1998. Note: Percentages are based on the estimated 5,010 2-year and 4-year post-secondary education institutions in the nation. Percentages are computed across each row. Because of rounding, percentages may not sum to 100 and detail may not sum to totals. Source: U.S. Department of Education, National Center for Education Statistics, Post-secondary Education Quick Information System (PEQIS).

According to a report by Dr. Bill Cooper (1998) of Oklahoma State University, “in the United States, as well as in Oklahoma, the employment workforce is becoming an aging workforce with significant increases in the age of the average worker by the year 2006”(p.2). The U.S. Bureau of Labor Statistics made the projection that:

The supply of workers, the labor force, is projected to increase by 15 million over the 1996-2006 period, from 134 million to 149 million. This

represents an increase of 11 percent, less than the 14 percent increase over the previous 10-year period, 1986-1996. The projections indicate that the demographic composition of the labor force is expected to change because the population itself will change and because work force participation will change.

The labor force age 45-64 will grow faster than the labor force of any other age group as the baby-boom generation (born 1946-64) continues to age.

The labor force 25 to 34 years of age is projected to decline by almost 3 million, reflecting the decrease in births in the late 1960s and early 1970s.

The labor force participation rates of women in nearly all age groups are projected to increase, but at a more moderate rate than in the previous 10-years, particularly among younger women.

Men's labor force participation rates are projected to continue to decline for all age groups under 45 years of age. As a result, the women's labor force will grow more rapidly than the men's, and the women's share of the labor force will increase from 46 to 47 percent. (p. 2)

Cooper (1998) states that:

The statistics show that the fastest growing segment of the workforce in the coming 10 years will be the older worker who is most likely to be place-bound and therefore less able to participate in traditional campus-based educational programs. (p. 2)

Oklahoma should continue promoting college education for its younger citizens, and maintain a traditional campus setting, but these older workers will need a methodology to attain the education necessary to obtain higher paying jobs that hopefully, economic and business growth will bring. Cooper (1998) was trying to prove that more emphasis and funding should be placed on distance education by Oklahoma State University because of the projected increasing need.

Even though there has been increased interest in distance education and its Internet component, there is still a question on its viability as an educational tool. There are many fears that this new concept in education will eventually replace our institutions of higher learning.

There has been concern that distance learning, especially Internet delivery, will break down socialization concepts that students learn over their tenure in a more normal classroom environment. Data is still being accumulated on this facet of the higher education experience, but if a web-based course is properly designed, students still have the opportunity to interact with their instructor and fellow students, share thoughts and question philosophies that have been a cornerstone of traditional education for centuries.

### The Characteristics of a Successful Distance Learning Program

What are the characteristics of a successful distance-learning program?

According to Dr. Sylvia Charp (2000), Editor-in-Chief of T.H.E. Journal, a successful program has the following characteristics:

- Clearly defined performance and competency-based objectives that are understood by both instructor and learner.
- Acceptance of students with the background, knowledge and technical skills needed to undertake the program.
- Manageable class size—classes have enrollment of 15 to 30 students.
- Instructors are available at regular, stated hours.
- Demonstrated commitments and on-going support, both financial and technical, exist for continuation of the program for a period sufficient to enable students to complete a degree or certification if so desired.
- Institution evaluates its programs' educational effectiveness, including assessment of student learning objectives. (p.10)

Many higher education institutions have realized the importance and have been involved in distance learning for many years, but like many institutions of higher education in Oklahoma and the United States, still considers this type of education an exception to the norm. As Daniel E. Kinnaman (1996) has stated,

Unfortunately, for the most part, we still tend to treat distance education as a curious add-on to schooling. Instead, we need to recognize that the capacity of today's technology to overcome the restrictions of time and place pretty much invalidates the traditional model of schooling. (p. 94)

It is with this thought that views are starting to change and an increased number of professors are starting to exhibit a curiosity toward the many possibilities distance learning, especially Internet delivered courses can bring. They are starting to realize that maybe it is possible to have a global classroom or a global school without sacrificing local autonomy.

All in all, distance education is growing by leaps and bounds, but it is not seeking to replace the brick and mortar of traditional educational institutions. It seeks not to challenge or change higher education's structure, but to extend it to those who might be time or physically bound. It also seeks to reach out and provide everyone with an opportunity to learn not bounded by the number of seats in a classroom. In fact, because of the advancements and availability of technology such as the Internet, the classroom becomes "virtual."

### The Virtual Classroom

The "virtual classroom" is a relatively new development in distance learning. It is based on computers, software and the Internet. It provides the students with the

capability to access a course from anywhere; as long as where they are has a computer, software and Internet connectivity. The virtual classroom usually consists of some methodology that emulates its traditional cousin.

The concept has been driven more by technology and our fast-paced lives than anything else. Gubernick and Ebeling (1997) stated, "Over 1 million students are now plugged into the virtual college classroom, which compares with 13 million attending brick and mortar schools. The number of cyberstudents will more than triple by the turn of the century"(p. 85). An article by Neeley, Niemi and Ehrhard (1998) stated that alternatively delivered education is especially important to the 21<sup>st</sup> century because baby boomers are returning to institutions in increasing numbers to refresh or enhance their knowledge base and skills. Some are preparing for career changes and others are learning for the pure pleasure of learning. They go on to say that by the year 2001, more than 15 million adults are expected to be enrolled either full or part time.

Even though it seems the entire educational world is moving into the realm of cyberspace, there are many considerations one must contemplate before developing an on-line course. An institution must not develop a course or program just to keep up with everyone else. There must be some identifiable need before attempting this rigorous and sometimes expensive task. According to an article in the journal Techniques, there are some basic questions a school or individual must ask before developing a course for on-line delivery (Guan & Zirkle, 2000).

- Why do we want to offer distance learning?
- What purpose will web-based courses serve for the school and students?
- Do we have the right resources?

Making the decision to go “on-line” is just the beginning. Many factors determine the successful venture.

One factor that is often overlooked is how does the course compare with traditional instruction when considering the various learning styles exhibited by students? Training (or education), no matter how it is delivered, will not take hold unless individual learning styles are first addressed and respected (Goldstein, 1998).

### Learning Styles

Figure 2 briefly defines some various learning styles that should be considered when developing a web-based course (Ross & Schultz, 1999).

#### Visual Web

According to Sarasin (1998), many learners prefer processing information primarily through sight. These learners can easily become confused if a professor mainly uses the auditory, lecture approach to teach course content. When used appropriately, web-based courses can enhance the visual student’s learning experience (Ross & Schultz, 1999). Online course animations, hypertext, or clickable diagrams and video clips can clarify concepts that a static textbook cannot (Ross & Schultz, 1999). For example, in an anatomy class, a full-bodied image can be programmed so that the learner can click on body muscles to see their origin and insertion points (Ross & Schultz, 1999). Video clips can be used to visually depict almost anything.

Learning Style Terms Defined	
Learning Style	Characteristics
Visual (Dunn & Dunn, 1978)	<ul style="list-style-type: none"> <li>Processes information primarily through sight</li> <li>Enjoys tasks involving reading, recitation, taking notes, watching videos</li> </ul>
Auditory (Dunn & Dunn, 1978)	<ul style="list-style-type: none"> <li>Processes information primarily through sound</li> <li>Enjoys tasks involving active listening, lecturing, communication, music, narration</li> </ul>
Kinesthetic/haptic (Dunn & Dunn, 1978)	<ul style="list-style-type: none"> <li>Processes information through whole body movement and through life experience/applications</li> <li>Enjoys tasks involving acting, building, manipulating, cause-effect, designing, playing, field experiences</li> </ul>
Social/collaborative (Grasha-Riechmann, 1974)	<ul style="list-style-type: none"> <li>Processes information best within social situations and cooperative groupings</li> <li>Enjoys tasks involving peer collaboration, interactive discussions, debate, interviewing, sharing of stories</li> </ul>
Concrete sequential (Gregorc, 1982)	<ul style="list-style-type: none"> <li>A linear, sequential thinker who processes information best when it is tangible and grasped by the senses</li> <li>Enjoys tasks involving recognition of cause-and-effect relationships, lab exercises, conducting task analysis, flowcharting, developing arguments, writing or following directions, generating examples, analyzing key ideas</li> </ul>
Concrete random (Gregorc, 1982)	<ul style="list-style-type: none"> <li>A random, multidimensional thinker who processes information best when it is tangible and grasped by the senses</li> <li>Enjoys tasks that include exploration, problem solving, hypothesis generating, independent thinking, synthesizing, idea generating, anticipating problems (what if . . .)</li> </ul>
Abstract sequential (Gregorc, 1982)	<ul style="list-style-type: none"> <li>A linear, sequential thinker who processes information best when it is invisible to the senses and involves reason and intuition</li> <li>Enjoys tasks involving interpreting textual material, vocabulary building, abstracting, integrating disparate information, logical analysis, conceptual model building, debate</li> </ul>
Abstract random (Gregorc, 1982)	<ul style="list-style-type: none"> <li>A random, multidimensional thinker who processes information best when it is invisible to the senses and involves reasoning and intuition</li> <li>Enjoys tasks involving global evaluation, interpersonal interactions, affective analysis, multidimensional analysis, creative, imaginative tasks, mind mapping</li> </ul>

Figure 2. Learning Styles.

Learners who have difficulty processing auditory information in a lecture could greatly benefit by having the professor's written lecture notes available online.

Presentations can also be converted and placed online to be viewed.



### Auditory Web

Some learners prefer listening to course material as a way to internalize content (Ross & Schultz, 1999). Most students who learn by this style usually refrain from taking notes in class, choosing instead to listen intently to the lecturer (Sarasin, 1998).

Even though the web is mostly visual, auditory learners can still benefit. Lectures, discussions and course summaries can easily be taped and placed on a course website as an audio file. This type of instruction is also easy to archive so a number of audio files can be available to students at their leisure.

### Kinesthetic Web

The kinesthetic (or haptic) learner prefers doing something in order to learn (Sarasin, 1998). These type of learners can often times get extremely frustrated when theory is not put to practice (Ross & Schultz, 1999). Some ways to involve this type of learner might include: practice problems, lab experiments, creating solutions, doing physical activities, and brainstorming ideas (Ross & Schultz, 1999).

This style usually takes a little more technological involvement. There are several interactive, animated products and programs available such as, Java and Javascript to facilitate this style. Using these tools, for instance, a mouse becomes an extension of the hand and can be used to assemble parts and see how pieces relate to each other (Ross & Schultz, 1999).

## Social Web

Some students learn by interacting with their peers. These type of students are of often referred to as social learners (Grasha & Riechmann, 1974). Grasha and Riechmann state that collaborative learners seek out peer interaction as an important part of the learning process. One would think that the traditional classroom environment would facilitate this style, but in reality it can be quite isolated if not structured properly.

A way that an instructor can facilitate this style in a web environment is to allow course students to collaborate through a list-serv, online bulletin board, forum or newsgroup (Ross & Schultz, 1999). A more sophisticated way is to provide real-time, online chat room capability. This methodology allows synchronous communication with others in the class.

Another facet of learning style explores cognitive processes. Cognitive learning style can be defined as “distinctive behaviors which serve as indicators of how a person learns from and adapts to the environment”(Gregorc, 1979, p. 234). This style of learning deals with how a person interacts with, and responds to, the immediate environment (Ross & Schultz, 1999). The tool that is used to determine these cognitive learning styles is the Gregorc Style Delineator Instrument.

This instrument focuses on two types of mediation abilities in adults: perception, the means which one is able to grasp information and ordering, the means in which one arranges, systematizes, and disposes of information. The two dimensions of ordering are sequential and random; the two qualities of perception are abstractness and concreteness (Gregorc, 1982). Gregorc combines these abilities to create four mediation channels of

mind styles: concrete sequential (CS), concrete random (CR), abstract sequential (AS), and abstract random (AR).

#### Concrete Sequential (CS) Web

The CS learner usually enjoys tasks involving linear processing of tangible stimuli (Ross & Schultz, 1999). A way to involve students with this learning style is to incorporate some kind of virtual laboratory experiment into the web-based course. PowerPoint presentations can be used with verbal summaries of each slide (Ross & Schultz, 1999). This can be useful to these students due to the sequential ordering of the slide presentation. These students also enjoy clear, precise instructions for assignments and other tasks. Anything else that relates to what the instructor expects can be beneficial to these students also.

#### Abstract Sequential (AS) Web

This type of student can be described as one having a passion for learning (Butler, 1984). This student strongly believes that knowledge is power and being able to display that power is an essential goal (Gregorc, 1982). There are several ways to meet these students' needs. Crotty (1995) believes that the instructor should allow students to construct their own learning and make connections to existing bodies of knowledge by posting salient, updated links to supplementary resources on the Web. AS students also enjoy tasks involving vocabulary building (Gregorc, 1985). Glossaries should be created for those courses with a number of technical terms.

### Concrete Random (CR) Web

According to Ross and Schultz (1999), the concrete random student is independent and self-motivated. These students enjoy working on creative projects requiring divergent thinking about concrete concepts. Web-based instructors can post directed study questions that allow the CR student to conduct online research.

### Abstract Random (AR) Web

These learners enjoy learning if the course is an open, flexible, communicative environment (Ross & Schultz, 1999). They are often frustrated by the lecture format. They also seek peer interaction as a part of the learning process and benefit from the online chat environment (Ross & Schultz, 1999). Anything an instructor can create in the web environment that utilizes multimedia, graphics, text and links will be beneficial to these types of students.

Another learning style that can be considered by an instructor when developing a course was developed by Carl Jung and popularized by Katherine Briggs and her daughter, Isabel Briggs-Meyers.

### The Myers-Briggs Learning Style

The Myers-Briggs assessment is based on the work of Carl Jung. A mother-daughter team took the work of Jung and proceeded to develop a methodology that would bring Jung's work to the masses. They developed an instrument that would easily ascertain a personality "type" or "preference." The Introversion/Extroversion preference

was added to Jung's basic types due to their observations. This assessment provides a multidimensional approach to personality types and learning styles.

It basically utilizes four bi-polar pairs to describe an individual and yields 16 different personality types with associated learning styles (Bull, 1999). They are:

- Extraversion/Introversion (E/I) - Measures the way an individual seeks energy. Some individuals seek energy from people and some seek it more internally from thinking. There are extremes in both cases where an extreme extravert can not function without being with others, and extreme introversion where they can not function unless it is in a quiet place by themselves.
- Extraversion – Extraverted people are very outgoing and need contact with other people. They generally want to work with others, and if they can not talk about it, they will not learn it (Bull, 1999). They also generally are in the Do-Think-Do mode of synthesizing information. They work best in collaborative learning, problem-based learning teams, group case studies, group projects, and synchronous web-based learning.
- Introversion - Introverted people are very internal, reflective type individuals. They like to think about and work with ideas. They experience the world in a Think-Do-Think methodology. If they can not think about a concept first, they will not do it. They learn best alone or in a lecture type of environment. Some prescribed

learning methods might include lectures, video, library research, writing and asynchronous web-based learning.

- Sensor/Intuitive (S/N) – This dimension describes an individual's preference of finding out about things. The Sensor generally uses their five senses to find out about things. The Intuitive like to use their five senses, but also that sixth sense (intuition) to discover meaning. They also generally see more possibilities in things than sensors.
  - Sensor - Sensors thrive in a world of experimentation and observation. Sensors seek specific answers and facts to problems. They work in the “here and now” and need specific directions. They would like diagnostic case studies, problem-based learning, role playing, experiments, field trips, and tours.
  - Intuitive – Intuitives like settings that cause them to utilize their imagination, creativity or problem-solving abilities. They usually avoid detail and give generalized answers to specific questions. They are typically looking into the many possibilities the future holds for them, and they are not keen on closure. They like to create and work with new ideas. They would prefer case studies, theoretical discussions, creative problem-solving and studies in the future.
- Thinking/Feeling (T/F) – This dimension relates to how decisions are made. Thinkers make decisions based on logic or some rational process.

Feelers tend to make decisions based on how they feel or what feels right at the moment.

- Thinking – The thinker decides on the basis of logical prediction or analysis (Bull, 1999). Thinkers are generally cool, calm and collected and are objective and very direct. They usually would rather be right than liked. Materials used in learning should be well structured and provide a way for logical analysis. Some thinking-based learning would include: cooperative learning, debate, lecture, pros and cons, research, literature reviews, and papers.
- Feeling – Feelers place more emphasis on values or feelings about things. They generally take others' feelings into consideration when making a decision. They feel it is more important to be liked rather than right. They prefer harmony and will avoid conflict whenever possible. In most group situations, the feeler will try to facilitate consensus. Their learning style is anything that allows the sharing of feelings.
- Judging/Perceiving (J/P) – This dimension deals with how an individual views the world. Judgers like to live a very planned, orderly life. Perceivers live for the moment and are usually very flexible.
  - Judging – Judgers learn best when they understand the goals of learning and there is a structure in place to allow them to do so.

They are the list makers. They keep schedules and do not like surprises.

- Perceiving – Perceivers are free-spirits. They learn almost by accident. They are usually very creative and spontaneous.

The following are characteristics of the 16 types taken from Dr. Kay Bull's Computer Mediated Learning course (Bull, 1999).

- ISTJ General Characteristics – Serious, quiet, earn success by concentration and thoroughness. Practical, orderly, matter of fact, logical, realistic, and dependable. See that everything is well organized. Takes responsibility. Makes up their own minds as to what should be accomplished and work toward it steadily.
- ISTJ Learning Characteristics – For ISTJ, (mastery of facts) learning is best when following a well laid out and sequential plan. They are hard workers and are persistent in learning. They learn sequentially. They have a need for order and prefer direct experience. They work well alone on practical activities. They will get work done on time and attend to details but sometimes to the point of a perfectionist. They do not work well in a team-based environment.
- ISFJ General Characteristics – Quiet, friendly, responsible and conscientious. Works devotedly to meet obligations. Lends stability to any project or group. Thorough and accurate. Their interests are usually not technical. Loyal, considerate, perceptive, and concerned about how others feel.



- ISFJ Learning Characteristics – ISFJs like to have all the material to be learned presented clearly. They find fact acquisition easy but want to be sure that their facts are accurate. Learning for the ISFJ should be practical and contain lots of people examples for best retention. ISFJs tend to be over achievers. They learn best alone. They like well-ordered learning material and teaching processes. They like direct experience.
- INFJ General Characteristics – They usually succeed by perseverance. They have originality, and a desire to do whatever is needed or wanted. They put their best efforts into their work. They are usually quietly forceful, conscientious, and concerned for others. They are also respected for their firm principles. They are likely to be honored and followed for their clear vision on how to best serve the common good.
- INFJ Learning Characteristics – INFJs prefer theory over practical application. They will want to find the underlying meaning of things. They are likely to want to work alone or with a harmonious rather than a competitive group. They will seek open-ended instruction rather than closed-ended. They would rather have fact-based presentations. INFJs are likely to be creative, imaginative and artistic. This may mean that they may have difficulty following directions designed to induce conformity. They are likely to want to express their creativity by writing in a variety of areas. They will challenge authority and prefer enthusiastic instructors. They get work done because of their excellent time management skills.

- INTJ General Characteristics - Have original minds and great drive for their own ideas and purposes. Have long-range vision and quickly find meaningful patterns in external events. In fields that appeal to them, they have a fine power to organize a job and carry it through. Skeptical, critical, independent, and determined. have high standards of competence and performance.
- INTJ Learning Characteristics - The INTJ is theory driven. They use analysis in problem solving and strive for competence. The INTJ learns by challenging the conventional thinking. They like to create new models to change their conceptualization of reality. Learning should be purposeful and related to some larger purpose. They are task oriented and challenged by new problems. They are independently minded. They want people to make sense and this can cause problems in group learning. INTJs can develop unique solutions to difficult and complex problems. They have high standards for competence and performance.
- ISTP General Characteristics - Cool onlookers -- quiet, reserved, observing and analyzing life with detached curiosity and unexpected flashes of original humor. Usually interested in cause and effect, how and why mechanical things work, and in organizing facts using logical principles. Excel at getting to the core of a practical problem and finding the solution.
- ISTP Learning Characteristics - The ISTP is a linear learner who likes direct experience. Learning materials for this learner should be logically

structured and sequential. This learner does not like to waste energy.

ISTPs exhibit detached curiosity. They learn by developing new schema categories for material. They like clearly presented material that helps them to find the underlying principles in the data. ISTP prefer material which is objective. They like to bring order to unorganized facts.

Technical problem solving is preferred. They like to take things apart to see how they work. They are good practical problem solvers.

- ISFP General Characteristics - Retiring, quietly friendly, sensitive, kind, modest about their abilities. Shun disagreements; do not force their opinions or values on others. Usually do not care to lead but are often loyal followers. Often relaxed about getting things done because they enjoy the present moment and do not want to spoil it by undue haste or exertion.
- ISFP Learning Characteristics - The ISFP is a linear thinker who is a direct experiencer. There is a preference for well-defined goals and linear sequences. They like clear but flexible teachers. This learner needs non-competitive and low stress projects for group work. They require low levels of stimulation during study. ISFP will be interested in new things before the rest of the crowd. They do well in experiential learning. They do well in learning activities requiring sensory, motor or kinesthetic activity. ISFPs are not usually leaders in group learning situations.
- INFP General Characteristics - Quiet observers, idealistic, loyal. Important that outer life be congruent with inner values. Curious, quick to see possibilities often serves as catalysts to implement ideas. Adaptable,

flexible, and accepting unless a value is threatened. Want to understand people and ways of fulfilling human potential. Little concern with possessions or surroundings.

- INFP Learning Characteristics - The INFP student is a global learner who likes to both read and listen. This learner will start by investigating theory then move to the application. The INFP will do well working independently on autonomous tasks. They are curious and can act as catalysts in group settings. They are adaptable and flexible unless their values are threatened. They learn conceptually particularly if the information is original or complex. They seek patterns and try to bring order to the world. They prefer enthusiastic instructors. INFPs need quiet to study.
- INTP General Characteristics - Quiet and reserved. Especially enjoy theoretical or scientific pursuits. Like solving problems with logic and analysis. Interested mainly in ideas, with little liking for parties or small talk. Tend to have sharply defined interests. Need careers where some strong interest can be used and useful.
- INTP Learning Characteristics - The INTP is a global learner who favors open-ended instruction. They learn by solving problems with logic and analysis. They have sharply defined interests and learn best when these interests are focused on. They are highly curious, global and intense thinkers. They learn theory and principles more quickly than practical applications. They can get intensely involved in learning processes. They

need quiet for study. Typically they treat work as play and have little play in addition. In schoolwork they may not follow through on details. They can see fine discriminations in visual and verbal learning. They are good at understanding, exploring, mastering, and manipulating systems.

- ESTP General Characteristics - Good at on-the-spot problem solving. Like action, enjoy whatever comes along. Tend to like mechanical things and sports, with friends on the side. Adaptable, tolerant, pragmatic; focused on getting results. Dislike long explanations. Are best with real things that can be worked, handled, taken apart, or put together.
- ESTP Learning Characteristics - ESTPs are linear thinkers who need to know why they are supposed to learn before they will commit to learning it. These learners will like and do well in group projects, class reports, and team competition. They learn well from audiovisuals and may accept lectures as a potent dissemination mechanism. They are good on-the-spot problem solvers, and focus on getting results. They dislike long explanations and favor working with things which can be worked with or taken apart. This learner is impatient with theory that cannot be directly assessed. Tends to turn study groups into play groups. There is a strong interest in physical activity. Abstractions and theory usually seen as irrelevant. ESTPs tend to be the leaders in learning groups.
- ESFP General Characteristics - Outgoing, accepting, friendly, enjoy everything and make things more fun for others by their enjoyment. Like action and making things happen. Know what's going on and join in

eagerly. Find remembering facts easier than mastering theories. Are best in situations that need sound common sense and practical ability with people.

- ESFP Learning Characteristics - ESFPs are linear thinkers who need to know why they are supposed to learn before they will commit to learning it. These learners will like and do well in group projects, class reports, and team competition. They learn well from audiovisual presentations. They find it easier to remember facts than they do theories. They have common sense and practicable ability that is useful in certain kinds of learning. Experiential curiosity is a hallmark of this learner. They prefer experience to books or lectures as a learning mode. Authentic assessment is preferred. ESFPs learn and solve problems through a trial and error process. They are unlikely to do well following directions and usually jump right into the experiential process. They study well in groups with external stimulation, like those low in arousal. Group work and study may facilitate learning by increasing focus and organization. They are likely to be early adopters of new things and ideas.
- ENFP General Characteristics - Warmly enthusiastic, high-spirited, ingenious, and imaginative. Able to do almost anything that interests them. Quick with a solution for any difficulty and ready to help anyone with a problem. Often rely on their ability to improvise instead of preparing in advance. Can usually find compelling reasons for whatever they want.
- ENFP Learning Characteristics - The ENFPs are global learners who like choices, the interaction in seminars, and group projects, team competition,

etc. They are very capable and usually they can do anything that they are interested in. However, interest is the driver. They deal easily with problems and are quick to pose solutions to problems. Much of their problem solving represents improvisation rather than preparation. ENFPs stimulate learning groups and they bring original, insightful, and ingenious ideas to problem solving groups. The learning materials must be stimulating to interest these learners. They enjoy complexity and abstraction but need variety in their class presentations. They tend to get bored easily or distracted with new ideas which is detrimental to completing projects.

- ENTP General Characteristics - Quick, ingenious, good at many things. Stimulating company, alert and outspoken. May argue for fun on either side of a question. Resourceful in solving new and challenging problems but may neglect routine assignments. Apt to turn to one new interest after another. Skillful in finding logical reasons for what they want.
- ENTP Learning Characteristics - ENTPs are global learners who need both choices and deadlines. They learn through reading, listening, and interacting in seminars. They prefer open-ended instruction and are interested in theory. They are good problem solvers who develop unique solutions but they may not be interested in routine assignments. ENTPs like change, intellectual challenge, value autonomy and competence. These learners learn best through debate, dialogue, and critique. They

learn well from and create conceptual models. They prefer group learning where they can argue.

- ESTJ General Characteristics - Practical, realistic, matter-of-fact, with a natural head for business or mechanics. Not interested in abstract theories; want learning to have direct and immediate application. Like to organize and run activities. Often make good administrators; are decisive, quickly move to implement decisions; take care of routine details.
- ESTJ Learning Characteristics - ESTJs are linear thinkers who have a strong need for structure in their learning. They like group work and direct experiential practice in authentic settings. They are the ones who make sure that things get done. These learners will ask exactly what must be done to learn the content. They want tangible results, immediately. They like teachers who do clear and logical presentations that are low keyed. They desire logic and facts. They want to see the ideas work in an authentic situation. ESTJs will set schedules and follow them; you should not worry about getting assignments from these students. In groups they will take charge and provide organization.
- ESFJ General Characteristics - Warm-hearted, talkative, popular, conscientious, born cooperators, active committee members. Need harmony and may be good at creating it. Always doing something nice for someone. Work best with encouragement and praise. Main interest is in things that directly and visibly affect people's lives.



- ESFJ Learning Characteristics - ESFJs are linear learners who like direct experience. They need to know why they are learning and how the learning will relate to the stated goals of the class. They like a variety of team activities. These learners think best while they are talking. They prefer to learn theory when it can be illustrated with human examples. They want harmonious learning so that they can concentrate. Therefore debate and competition are contraindicated. They are good at planning and follow through. They like to study in collaborative groups that help each other.
- ENFJ General Characteristics - Responsive and responsible. Feel real concern for what others think or want, and try to handle things with due regard for the other's feelings. Can present a proposal or lead a group discussion with ease and tact. Sociable, popular, sympathetic. Responsive to praise and criticism. Like to facilitate others and enable people to achieve their potential.
- ENFJ Learning Characteristics - ENFJs like seminars for the interaction. They like group learning activities if they are harmonious. They prefer open-ended learning that starts with theory and then goes to application. They strive to support others in group learning settings. They are most interested in learning how to get along with diverse others. They tend to think out loud when they are doing good thinking. They like to bounce ideas off others. They will work hard and achieve through persistence. They prefer to study in groups.

- ENTJ General Characteristics - Frank, decisive, leaders in activities. Develop and implement comprehensive systems to solve organizational problems. Good in anything that requires reasoning and intelligent talk, such as public speaking. Are usually well informed and enjoy adding to their fund of knowledge.
- ENTJ Learning Characteristics - ENTJs can learn through reading but they prefer group projects and seminars where they can interact with others. They are interested in models of how things work which are clearly presented by their instructors. They are stimulated by complex material and see applications for it beyond their present course of studies. They like to use knowledge to make things happen in authentic settings. They will create groups to help with their learning. They seek out practical material that will improve their efficiency and competency. They are big picture global learners.

One can see that simply putting up a web page with course information and lessons can leave some students wanting in their learning. Web-based courses can become impersonal and static if an instructor is not careful, so having something that addresses the various learning styles is of utmost importance if the course is to be successful. Of course, just like a traditional classroom class, all learning styles may not be able to be satisfied, but having an awareness of learning types and knowing which learning style inventory to select can assist an instructor in developing a course that can facilitate as many students as possible (Diaz & Cartnal, 1999). It will also help the developer/instructor understand why some students have problems in the course.

## Developing the Web Course

In planning a move from the physical classroom there are four levels of Course Webness to consider (Boettcher, 1999): Web presence, Web-enhanced course, Web-centric course, and Web course.

### Web Presence

A course with a web presence has all the information about the course that is traditionally in the course catalog. The website might also have pictures of the faculty, course outlines, bibliographies, and course requirements. Overall, the website will have a minimum of information and is more for a marketing technique than anything else. Development for the course will take little effort, but can grow as the course content grows.

### Web-Enhanced Course

This type of course utilizes web pages to support distribution of materials and provide student access to web resources. For a lot of faculty, this might be the first evolutionary step toward a full web course. More development knowledge may be required as the web page content might be more interactive.

### Web-Centric Course

A web-centric course makes significant use of web technology as students not only have access to materials and web resources, but there is usually some kind of

communication vehicle in place to facilitate the exchange of ideas. The main premise for this type of course is that the communication hub for the class has shifted from the physical classroom to the web. These courses can also be courses that are available within a limited geographic area, such as a campus or a city, but attract more students that need a more flexible format for their schedules, i.e. fewer classroom meetings. These courses might include intensive location-based orientation sessions, weekend seminars and other events.

### Web-Course

A full web course offers accessibility from anywhere at anytime via the Internet and a web browser. A web course takes full advantage of the tools and strategies offered by the Internet and the World Wide Web. There can virtually be no face-to-face contact among the students and the instructor, but communications take place through e-mail, discussion groups, forums, and live chat. These courses have several distinct advantages in its ability to reach more rural areas and those that cannot attend more traditional courses because of time or physical limitations. The development curve for these courses can be high. An instructor must understand how the Internet and the World Wide Web works and be familiar with web development tools, either web authoring or proprietary course tools.

Even though web development tools make developing a web course relatively painless, a developer should realize that a very important facet of instruction is still missing from the course - a live, dynamic instructor. To emulate this, an on-line instructor should develop a close relationship with the students. One way to do this may

be to start the course with a student-friendly home page. For example, Dr. Edward Harris of Oklahoma State University, College of Education posts a picture of himself with some personal information and in-turn, urges each of his students to include a photo of themselves with some personal information for posting so they can get to know each other and start to make a connection

Once the students get to know each other, some form of interaction should take place between the instructor/student and the student/student. Use of e-mail and electronic discussion can facilitate this and give more of a “real” feel to the course through interaction (Cooper, 2000). Many web-based course commercial packages provide bulletin board and conferencing features, and stand-alone software packages are available for free on the Internet or at a reasonable cost. One feature that dramatically facilitates interactivity is a chat option. This allows the instructor and students to hold discussions in real time.

The construction of the course content should facilitate the various learning styles (Bull, Montgomery, & Kimble, 2000). Simply uploading a PowerPoint presentation or an outline of the material is insufficient. There should be links to other web sites that augment the material being discussed or if possible, audio and video. One must remember, an instructor can no longer depend on his or her personality to carry the class. The technology demands that they be disciplined, organized and methodical (Daily, 2000).

Before the development of a successful web-based course, it is important to get student perspectives on what questions they ask themselves prior to starting a course and

what they consider a good course. Also, what type of student generally enrolls in an online course?

### Student Perspectives on Online Courses

Forty percent of those pursuing degrees in the United States are now over the age of 40 (Schofield, 1999). Many have families and are trying to juggle an education with their family responsibilities. Some are forced into retooling themselves due to accidents, illness, or some other unforeseen event. For instance, a woman in Rochester, New York lost her job with Kodak after 15 years. She decided to return to college and finish her degree. While she was searching for the right college and program, her husband became ill, and she was forced to return to work. She thought her education would have to be put on hold again. As she was browsing the Rochester Institute of Technology's web site, she noticed several classes and programs offered via the World Wide Web through their distance education program. It was the answer to her prayers. She enrolled, and in three years, obtained her BS degree in applied arts and sciences, while continuing to work and care for her husband (Dwight, 2000). This is just one example of how distance education and Internet-based courses have helped those who otherwise might not have had access to further their educational needs.

Many of these students also do not have to be computer-literate in their chosen profession, or they are only familiar with job related computer applications, so computer and Internet skills are questionable. Many courses and programs are seeing a dramatic influx of these working adults that are taking courses to improve their understanding of a

particular subject or to better their promotability in their current job or marketability in the field (Dwight, 2000).

Web-based courses can be delivered from anywhere now. They are not limited by time and space. Students have the option in many programs to get their course credit from a variety of sources. There are some important considerations when registering for an on-line course (Gale, 2000).

- Is the institution accredited? Does the institution have a reputation for delivering good content? Does the course offer credit towards a degree program?
- Do I have regular access to and sufficient knowledge of technology needed to participate?
- Am I prepared to spend extra time acclimating myself to the specific technologies being used?
- Will I be able to start at the prescribed date?
- Do I foresee any major travel and/or other plans during the time that I take the course?
- Do I have time? Am I motivated?

Once a course is chosen and completed, what are their thoughts about the experience? The following is from an article in Technology and Learning journal (Mather, 2000). This assessment is from three students who enrolled in various fully online, courses. All of these students are professionals who took the courses from higher education institutions for various levels of professional development.

Renee –

I liked the convenience of working at a time and place most comfortable for me, and the online venue allowed me to participate in a course that is not available to me locally. Additionally, the class makeup was a definite plus – there were participants from all over the world, and this provided the chance to meet and network with some very interesting folks.

Weekly assignments and discussions were posted in a forum for all to see and comment on, and our group did comment freely on each other's work. As people tended to answer in terms of their own experiences, it generated a lot of networking, and we found ourselves pointing one another to resources and people...helping one another make connections.

I found that throughout the course I did miss some features of a synchronous or face-to-face discussion. Although I believe that asynchronous discussion allows more thoughtful time to reflect, it sacrifices the immediacy of building on one another's ideas. In a sense, it is akin to carrying on many conversations at once, and in my vase, at least, that made it difficult to delve deeply or thoughtfully into any one idea in particular.

We have an unusual experience with this class that is probably unique to online learning: our instructor "disappeared"! Once the initial syllabus was posted, he dropped out of sight. Funny thing was, we didn't notice! As a group, the class was well into the fourth week of work before the students begin to question among ourselves about the lack of feedback from a course facilitator, and we finally brought it to the attention of the UCLA Extension administration. This resulted in our group having to restart the class with the next scheduled section, though the new instructor did accept the work that had been done already. (p. 20-21)

Jim –

I very much enjoyed the regular feedback from other students. We were required to post a certain number of responses each week. Some might think that this is artificial, but I find it an important requirement for building a group experience. People shouldn't be allowed to "lurk" in online courses, and the requirement keeps them from doing so.

The course required one team activity, where small groups were asked to solve a problem together. I really liked belonging to a small team to work on a project.



I wished for more of a sense of community, which I believe lends itself to personal accountability. During the course, I was very busy with client work, and it was sometimes difficult for me to spend as much time on the course as I would have liked. If I had the added “pressure” of teammates waiting on my input, I would have been more likely to spend extra time. I found myself going to the class profiles area a lot, looking at the pictures participants posted of themselves and reading their bios – just to remind myself that this is a group of real people. For these reasons, I think we would have benefitted from having more than one team project assigned.

I wished for more varied interactive tools, beyond those that just facilitate posting comments and responding to one another. Multimedia (video and audio), interactive forms – anything that lets students experience course content in multiple ways and also allows us to manipulate it a little – can and should be used in online courses. One more thing that I think is tremendously important is real-time communication. Students and faculty in the graduate program in which I teach all subscribe to the AOL Instant Messenger tool which allows us to see who in our community is currently online. We use it regularly to connect in one-on-ones or group chats. It somehow creates a sense of presence in a way that asynchronous environments don’t necessarily accomplish. (p. 20-21)

Stephanie –

The instructor was outstanding – a real expert in the field and the medium. The syllabus was organized and challenging, and took place over the course of 15 weeks. Each week new material was posted on the Web site that built on the information we were reading in the course text. We wrote every week, either uploading our drafts and flowcharts, or reviewing and commenting on fellow students’ work.

Interactivity was the message of the course, and the Web was the perfect medium. I learned a lot both by giving and receiving feedback. I don’t think I’ve ever received as much feedback from fellow students in any other course, or anticipated deadlines so eagerly.

At the start of the course there were about 15 students, but one-third of the class dropped out before it ended. The drop in the number of students, and why, was something I thought about often. Were people having problems with the technical end, uploading files and charts to the Web? Was it the big writing requirement in the course – were people expecting that this would be an easy three credits? I wondered, too, if the drop in enrollment was because we were all sharing our work so publicly. It took a while to establish a sense of trust in the critiquing process, and the challenge of

building that sense of trust is something that shouldn't be overlooked in online learning. (p. 20-21)

Even web-enhanced courses have shown benefit to the student. The following are some comments from a survey that was given to students in a Biology course at the University of Colorado-Denver (Stith, 2000):

“A better way to communicate with other students in class.”

“Easy access made studying easier.”

“Getting grades without disrupting the teacher.”

“A bit adventurous, which makes it entertaining and light.”

“This was my second online course, but the Web coupled with the class lecture cemented many topics and discussion.”

“I think it was a great idea, even though it was hard to learn at first because I has no previous experience on the Web.”

“I love taking the online quizzes more than once. The material stays in my head.”

“I like having the lecture notes on the Web, in addition to the calendar.”

“I've actually registered for an online summer class. It has taken some of the mystery away from using the Web.”

“Although I considered it a valuable research tool in the past, I have a better idea of how powerful a resource it can be.”

“I did know how the Web could be used for teaching, but it contains an enormous amount of information, and I enjoyed looking for it.”

These thoughts were typical in the research of the literature. Some common threads throughout were an online presence of the instructor, flexibility of the course, interactivity, and a sense of community.

Building a successful learning community will also help ensure the success of a web course. Palloff and Pratt (2000) provided several tips an instructor can follow to facilitate this very important part of web learning (Palloff & Pratt, 2000):

- Set up a well-organized course site that includes a place for students to socialize.
- Encourage students to get to know each other through sharing introductions at the start of the course.
- Establish guidelines for the class that provide enough structure for the learners, but allow for flexibility and negotiation.
- Promote collaboration through small group assignments, case studies, simulations, and group discussions of the readings.
- Encourage students to bring real-life examples into the classroom.
- Act as learning facilitator, not as a professor.
- Most of all, have fun and open yourself to learning as much from your students as they will learn from one another and from you.

Based on these thoughts and the general portrait of the typical online student, some other questions need to be considered when developing an online course (White, 2000):

- What is the minimum computer competency required for students taking online courses?
- What is the institution's role in providing students with basic computer skills?

- Will having more multimedia elements and higher computer specifications prevent students from accessing the course online?

Even with these in mind, problems sometimes occur in the best-designed courses, and should be taken into consideration in the development phase (White, 2000).

- Having to wait a long time for pages to load due to a slow Internet connection. The course should be developed with the “lowest common denominator” in mind. If the student base has a relatively slow connection, then bells and whistles like video and audio may not be suitable for the course.
- Difficulty submitting assignments through e-mail. E-mail can sometimes get lost just like its snail-mail cousin. Instructors should be aware of this and be flexible.
- Frustration with cumbersome navigation through the course structure. The course should be developed with the student in mind, not the instructor. Based on the above concerns, the course should be developed so the student can easily find everything needed to be successful in the course.
- Frustration with links to Web sites that don’t work. At all costs, avoid “link rot.” Periodically go through the links in the course and check to make sure they are still current. If not, this sends a message to the student that the course is not updated and the information may not be current.

## Course Construction

What constitutes a “good” Internet-delivered course? Regardless whether an instructor is developing a course using web authoring tools or a proprietary package, the following steps are general rules for the development and implementation of a web-based course (Gottschalk, 1995).

1. Do not rush in without a master plan
  - The instructor needs to think about the reason for developing a web presence. Will the course be a stand-alone course or will it be in conjunction with some other technology?
  - Become familiar with the software tools that will be utilized in the development of the page.
  - Utilize pre-existing information that has already been developed for the in-residence course. Do not re-invent the wheel. Also, look at what is already out on the web. Ask other educators/developers to share their experiences and materials.
2. Layout home pages well and consistently
  - Do not develop a course page that is confusing. Utilize a consistent format for each of the pages. Use text and colors that are easy to read.
  - Keep page lengths short. There should be a short index page that allows links to other short pages. This will allow students to jump

to specific information without going through a lot of unnecessary reading.

- Maximize links to internal information and minimize links to external information. The purpose of the home page is to provide information on a specific subject area. Provide links to other pages only if they provide useful and related information for the students.
3. Do not use unnecessary large graphics or sound/video clips
- Always remember the lowest common denominator. Not all students will have the latest and fastest technology. Large graphics and audio/video clips take a long time to download. Excessive time taken waiting for material to post to the screen will do nothing but frustrate the student and negatively impact the learning experience. Also, some students may not have video and sound cards that will properly run audio/video attachments.
4. Do not let the home page become out of date
- The home page should be part of ongoing course development. Information should be current and relevant to the subject matter. Periodically check that links do not suffer from “link rot,” that is, links that are no longer pertaining to the subject or have disappeared.

What should be put on a web page? According to Ackermann (1996), the home page should assist students find necessary course information, learn the material and get involved in thinking about the course material. Properly designed course pages will

facilitate thought, discussion, and active participation. The following elements should be included in the course page (Ackermann, 1996):

1. Course and Instructor Information
  - Include items such as the course topic, instructor office hours, textbook information, course objectives and grading policies. A picture of the instructor is helpful in “humanizing” the course.
2. Course Communication
  - Provide e-mail addresses for the instructor and class participants. Also, include links to discussion groups and feedback areas where the students can post information about themselves and any problems encountered.
3. Assignments and text
  - Distribute assignments and tests, provide for some kind of on-line completion or submission and perhaps self-tests for the students to judge their level of comprehension of the material.
4. Material covered in the classroom
  - Make lecture notes and handouts available either as web pages or downloadable files
5. Reference Material
  - List materials in print and electronic form that supplement the textbook. Links to associated web sites that augment the subject or provide research opportunities would enhance the course.

Even though the course is now in place, one must ask the question, is this for everyone? The following are some key considerations that faculty may want to consider (Reid, 2000):

- Advise students to not be too quick to enroll in a full course of online study. They should first introduce themselves to the use of technology by enrolling in an elective course offered over the Internet. The axiom, “don’t bite off more than you can chew” is very much in play here. Most Internet courses are more comprehensive than their traditional counterparts.
- These classes tend to circumvent scheduling problems by allowing learners to make choices as to where and when they will study and participate. This can also be the Achilles heel for some of the more disorganized students. It is just too easy to put off studying with all the freedom the technology provides. Many students drop the course after they discover it is not going to be as easy as first thought, or they fail when time gets away from them. Faculty should make sure the student understands the time commitment necessary to complete the course.
- The student is more responsible for his or her learning and some cannot handle it. Some students are more hands-on, face-to-face learners. Student progress should be monitored closely and those students having difficulty should perhaps be advised to take a more traditional approach to their education.



- Proficiency tests should be administered to ascertain a student's competency in taking an Internet-delivered course. There are many tests offered online that students can take to determine their success.

### Internet Courses—Pros and Cons

The best method to look further at this issue is to discuss the pros and cons of Internet delivered courses. In 1996, the Internet was starting to be seriously considered in the higher education world as a means of delivering education. More traditional methods of distance delivery were proving to be successful, but still required the instructor to be seen physically through television or video. Washington State University (WSU) was debating at this time what role technology should play in delivering education to students on campus as well as those in far places. Many faculty members and administration suggested that, “an infatuation with new technologies does not dictate teaching strategies” (Monaghan, 1996, p. A22). The faculty and administration were not anti-technology; they were just hesitant concerning the impact this new way of education would have on the teacher-student interaction. As Monaghan stated, “Many faculty members including some of those innovators are perturbed by the latest plans. Of particular concern is the prospect of being asked to teach courses via the Internet and e-mail” (p. A22-A23). Monaghan goes on to say, “Asynchronous classes-stored on the Internet or other computer platforms-make us pause. The existence of such classes implies that the university will ask students, even some who live on campus, to learn without contact with faculty members” (p.A22-A23). However, the faculty was reminded, “People here

still remember when videos were supposed to replace faculty, and that didn't last"

(p.A22-A23).

Advocates for the technology realize the potential reach of this form of delivery. It can provide opportunities to not only traditional students, but also to those who want to take courses or get degrees but are limited by distance or some physical disability that keeps them home-bound. The Washington State University study also consisted of those who thought this was a very viable way to reach students. According to Monaghan, the Director of Extended Studies at WSU stated, "Voice and e-mail allows professors to get to know some of their off-campus students better than those on the campus. The technology also enables the students to learn in a self-paced, asynchronous mode" (1996, p.A22-A23). As Nancy K. Herther (1997) stated it in the article, "Education Over the Web," "On-line learning is just in time and at your convenience" (p. 63).

Students all over the nation are applauding those institutions that have decided to offer courses via the Internet. An article by Richard Ashton (1997) in Home-Office Computing magazine stated,

Thanks to the Internet, credentials from UCLA are just a mouse-click away from evening classes at your local community college. You can take courses at your own convenience and have the worldwide library of the Web at your fingertips for instant research. And the cost for taking online courses is comparable with physically attending class, but without transportation accommodations and other sundry costs. (p.13)

Ashton interviewed several students. Terry Whipple, who runs a small beef farm in Iuka, Illinois, said, "My location is very rural. I'm 70 miles from the nearest college. By doing an online course out of the University of California-Berkley, I'm getting quality instruction at a school that I couldn't physically attend" (Ashton, 1997, p.13). Whipple

also stated that he has access to classmates in chat rooms for cyber-study groups and stays in touch with professors via e-mail. The final exam was made applicable to his entrepreneurial venture and the instructor assisted in his joining a members-only industry association that had a major impact on his business.

Another student, a 44-year-old sales manager for an electrical equipment company, is finally getting his degree through the University of Phoenix's online Bachelor of Science program. Loaded in his traveling laptop is all his course material. He boots up lectures and reading assignments after work, in airport lounges and hotel rooms. He is majoring in Business Administration and states that the course-work is more meaningful than at Cornell, the university he dropped out of many years before because of financial and other personal reasons (Gubernick, Ebeling & Drucker, 1997).

Even though it seems most students like the online option, there are some academicians that think that there is a decrease in the quality of instruction. Schulman and Sims (1999) discuss an experimental study that was conducted by Gerald Schutte at Cal State, Northridge (as cited by McCollum, 1997).

Schutte randomly divided his statistics class into two groups. One attended class as usual, listening to lectures, handing in homework assignments, and taking examinations. The other took an online version of the course, completing assignments on a World Wide Web site, posting questions and comments to an electronic discussion list, and meeting with their professor in an Internet Chat room. After an orientation session, students in the virtual class went to Dr. Schutte's classroom only for their midterm and final exams. On both tests, Dr. Schutte's, found the wired students outscored their traditional counterparts by an average of 20 percent. (p. 10)

Schulman and Sims (1999) conducted an experiment of their own at Nova Southeastern University-Fort Lauderdale, Fla., where they examined pre and post tests

scores of undergraduate students enrolled in online and in-class versions of the same class taught by the same instructors over a variety of disciplines. Forty students enrolled in five different undergraduate online courses during the Fall semester 1997. The courses were Organizational Behavior, Personal Finance, Managerial Accounting, Sociological Foundations, and Environmental Studies. The online students were compared to their traditional counterpart (59 students), and all participation was voluntary. Pretests were designed to measure the level of knowledge the students had for each course prior to its start. All pretests were scored on a 100-point scale. The average pretest scores for the online students were 40.70 (s.d.=24.03), and the average for the in-class students was 27.64 (s.d.=21.62). Posttests were then given at the end of the course to also test the knowledge of the students. The posttests were similar to the pretests and scored on 100-point scale. The average posttest score for the online students was 77.80 (s.d.=18.64), and the average for the in-class students was 77.58 (s.d.=16.93) (Schulman & Sims, 1999).

Using a matching t-test, the results indicated that the posttests for both groups of students were significantly higher than the pretests ( $t=14.24$ ;  $d.f.=98$ ;  $p=0.0000$ ). In comparing the pretest scores of the two groups, the results indicate that online students scored higher than the in-class students ( $t=2.82$ ;  $d.f.=97$ ;  $p=0.0059$ ). The results indicated that there were no significant differences between the posttest scores for the online students and the in-class students (Schulman & Sims, 1999).

In summary of this experiment, the study showed there was equal learning between the online and in-class students. The higher pretest scores of the online students may indicate that these students were better prepared for the course material than the in-

class students, however, this preparation may not have led to greater learning based on the posttest results. Overall, this study provided support for the effectiveness of online courses (Schulman & Sims, 1999).

Even though there seems to be more pros than cons to Internet delivered courses, there are some drawbacks. The main drawback is the discipline required from the instructor and the students to stick with the course. For the instructor, it is common to be lackadaisical about updating the web pages and communicating with the students since there is no set class time. As for the students, they have a tendency to put off doing the work since they are not forced into a face-to-face classroom environment (University of Illinois, 2000).

Another possible con concerns assessment and security. Many academicians are troubled by the seemingly lack of assessment options for online classes and student impersonation and security issues (Hsu, Marques, Hamza, & Alhalabi, 1999). There are some options, however.

#### Assessment

Hsu, Marques, Hamza, & Alhalabi (1999) offers several options to assessing student performance in the virtual classroom environment.

- Should the virtual classroom contain quizzes?
  - The main motivation for quizzes lies in the need for fast, frequent feedback, both for the instructor and the student, about the amount of information learned so far. There are several tools for creating

online quizzes, such as Jquiz, Test 2000, and Test Creator.

WebCT and other proprietary packages also contain methodology to administer quizzes.

- Online assignments
  - Assignments as opposed to quizzes, aim at evaluating whether students have acquired a more thorough competence in a topic or just understood the basics of it.
- Tests implemented online
  - Online tests can be considered a special type of quiz, in which extra restrictions (e.g. number of attempts, time to finish) are added and a more strict way of student identity verification prevention is used.
- Cheating
  - The main issues behind cheating prevention are impersonation and security. Some possible solutions involve: requiring the presence of a proctor close to the students while they take the test; establishing a time window during which all the students should attempt the test (avoiding impersonation of a colleague at a later time); and using randomly selected and sorted questions out of a (much) larger repository of possible questions. (p. 106)

### The Future

What does the future hold for the development of Web-based, distance education or, as it is referred to now, digital education? With the blistering pace of computer

technology development, one can only imagine what will be available to us in the next decade. A host of web technologies that augment HTML are assisting in improving the multimedia capabilities. Dynamic HTML (DHTML) is improving interactive options and has been joined by vectoring technology, streaming content, and Virtual Reality Modeling Language (VRML). The successor to HTML, XML, is making HTML archaic. Probably the most significant contribution to the advancement of online learning is the growing momentum behind interoperability standards that will allow multimedia content to become independent of a particular authoring or delivery platform (Barron, 2000). The following is a breakdown of some of these technologies (Barron, 2000):

#### Extensible Markup Language (XML)

Extensible Markup Language or XML is not necessarily the answer to bigger and better multimedia capabilities. What it does is let content be managed independently. Content can be lifted from XML authored multimedia, Web-based or otherwise and dropped into another template. It adds new tags to the standard formatting tags used in HTML. Multimedia developers can distinguish between content and format and lift the content to be poured into other XML templates allowing it to be used in other forms, web-based or any other platform. Click2Learn.com recently developed a custom application for multinational customer that uses XML to quickly tailor online courses for audiences of different languages (Barron, 2000).

#### DHTML

DHTML allows for more enticing interactions without the need for browser plug-ins.

### Vector Tools

It is an ideal tool for creating multimedia. This technology moves away from typical pixel by pixel rendering of graphics to a scaleable format that uses less bandwidth, making animations more feasible. Macromedia Flash is a good example.

### Virtual Reality Modeling Language (VRML)

Virtual Reality Modeling Language or VRML makes 3-D, web-based simulation a reality without the need for proprietary authoring software. What does this mean to the course developer? A developer can create virtual 3-D web areas that would allow walk-throughs of buildings, laboratories, and even classrooms. These virtual spaces do not need special head--gear or gloves. It will be all right on the screen.

### Interoperability

Interoperability means that all proprietary software specifications will be stripped away allowing all authoring tools, learning management platforms and content to be interchangeable. The course developer will not have to be concerned with the identification of computer platforms, servers, and software the student will be using to access the course.

As the myriad of technologies merge, digital learning will open up new doors to everyone. Education that could be accessed only by a few will be available to all. Imagine all the possibilities.



## Summary

All in all, the impact of “cyberlearning” allows many people the opportunity to pursue college degrees or just take courses to update skills or knowledge while working a full-time job and living many miles from a college, but how effective are they? The University of Phoenix recently gave standardized achievement tests to a group of Bachelor of Science graduates from their institution and competing, on-campus programs at three public Arizona universities. On average, the on-line students scored 5% to 10% higher than their traditionally educated peers and maintained that margin upon completing their coursework (Gubernick, Ebeling & Drucker, June 1997, p.90). In other studies, grade distribution has shown repeatedly that students do as well in a distance learning atmosphere as they do in a physical classroom atmosphere (Wade, 1999). The educational trend seems to be toward this form of education.

More and more people today appear to want an education more on their terms, an education that facilitates a career as well as an opportunity to learn. Institutions who fail to accommodate these new students may ultimately fail. Peter Drucker, a premier management philosopher, states, “Universities won’t survive. The future is outside the traditional campus, outside the traditional classroom. Distance learning is coming on fast” (Gubernick, Ebeling & Drucker, p. 84). Internet delivered courses is the future of education. As technology advances and becomes more available to the public, the definition of the “traditional” student will change. We as institutions have to be flexible and forward thinking enough to facilitate this next generation learner.

In a study by The Institute for Higher Education Policy and sponsored by the National Education Association and Blackboard Inc. a series of benchmarks was established that brought clarity to the debate of whether there was quality in distance education. The report, "Quality on the Line" identifies 24 benchmarks considered essential to ensuring excellence in Internet-based distance learning. The benchmarks are divided into seven categories of quality measures currently in use on campuses around the nation (Institute for Higher Education Policy, 2000). This report established benchmarks made up of strategies used by colleges and universities that are active in online learning and coincides with information and data found in other literature reviewed for this study. The following is a summary of the benchmarks categorized into main areas that higher education institutions should consider when developing and implementing an online presence (Institute for Higher Education policy, 2000). This list represents the final benchmarks. Some benchmarks were eliminated in the final analysis due to disagreement among the study institutions or had little presence and some were added or combined.

#### Institutional Support Benchmarks

- A documented technology plan should be developed that includes electronic security measures (i.e., password protection, encryption, backup systems) and operational to ensure both quality standards and in the integrity and validity of information.
- The reliability of the technology delivery system is as failsafe as possible.
- A centralized system should be in place that provides support for building and maintaining the distance education infrastructure. (p. 2)

Figure 3 represents the issues and the study results for Institutional Support.

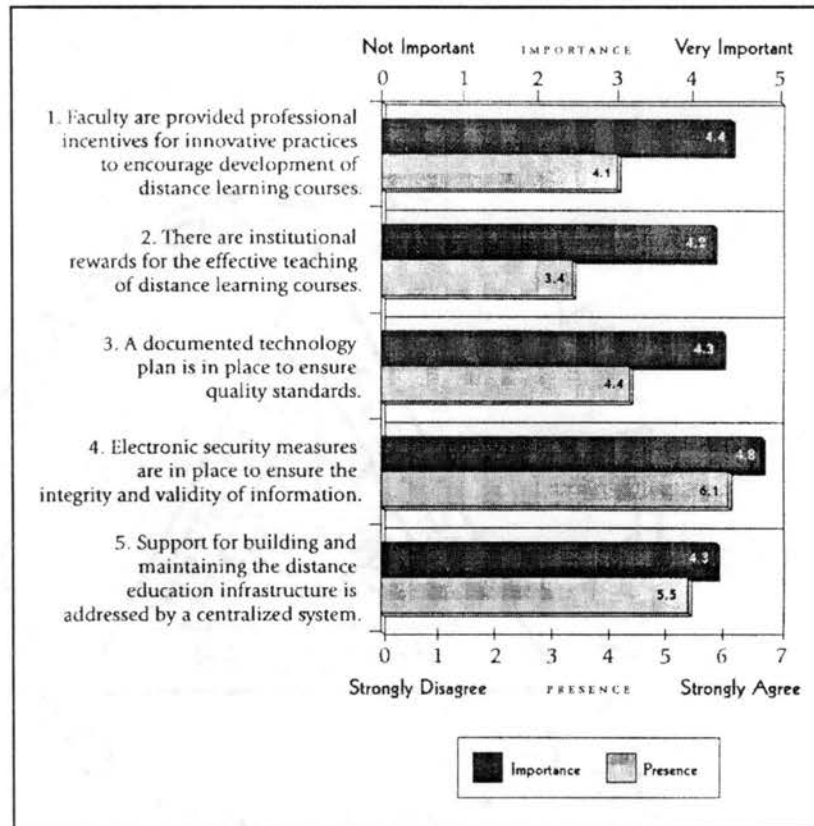


Figure 3. Institutional Support Benchmarks.

### Course Development Benchmarks

- Guidelines regarding minimum standards are used for course development, design, and delivery, while learning outcomes—not the availability of existing technology—determine the technology being used to deliver course content.

- Instructional materials are reviewed periodically to ensure they meet program standards.
- Courses are designed to require students to engage themselves in analysis, synthesis, and evaluation as part of their course and program requirements.

(p. 2)

Figure 4 represents the issues and the study results for Course Development.

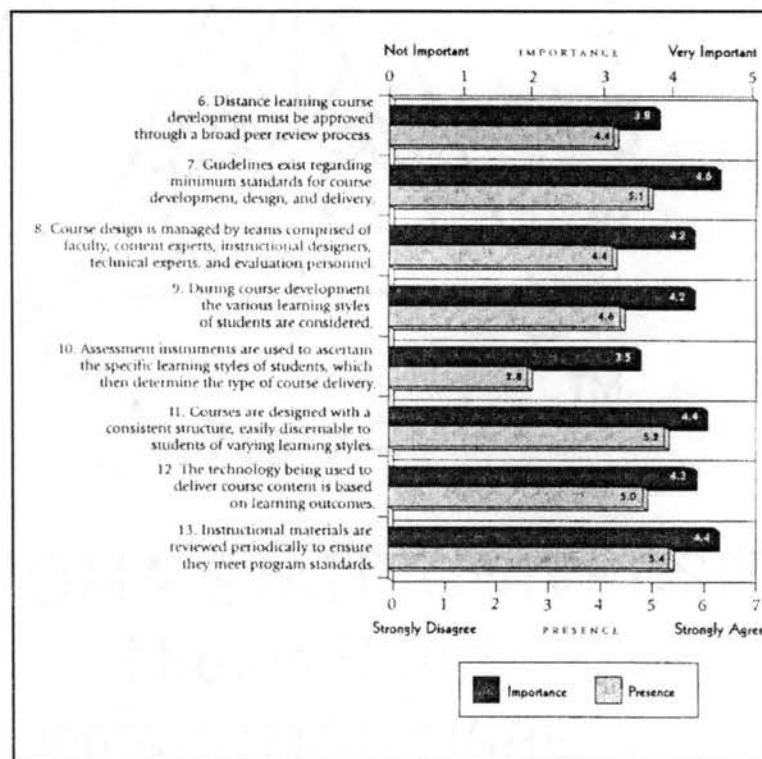


Figure 4. Course Development Benchmarks.

## Teaching/Learning Benchmarks

- Student interaction with faculty and other students is an essential characteristic and is facilitated through a variety of ways, including voice-mail and/or e-mail.
- Feedback to student assignments and questions is constructive and provided in a timely manner.
- Students are instructed in the proper methods of effective research, including assessment of the validity of resources. (p. 3)

Figure 5 represents the issues and the study results for Teaching/Learning.

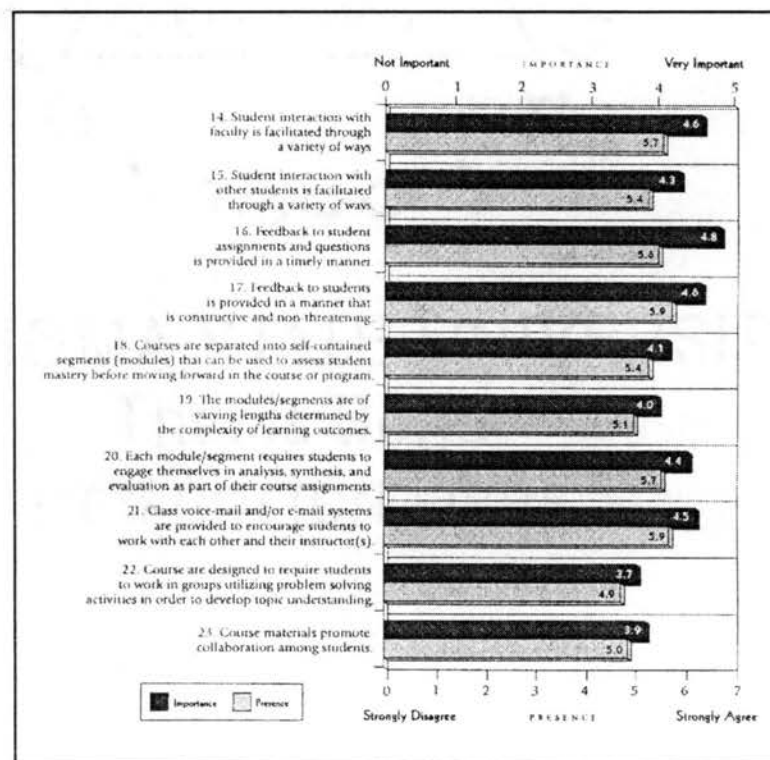


Figure 5. Teaching/Learning Benchmarks.

## Course Structure Benchmarks

Figure 6 represents the issues and the study results for Course Structure.

- Before starting an online program, students are advised about the program to determine (1) if they possess the self-motivation and commitment to learn at a distance and (2) if they have access to a minimal technology required by the course design.

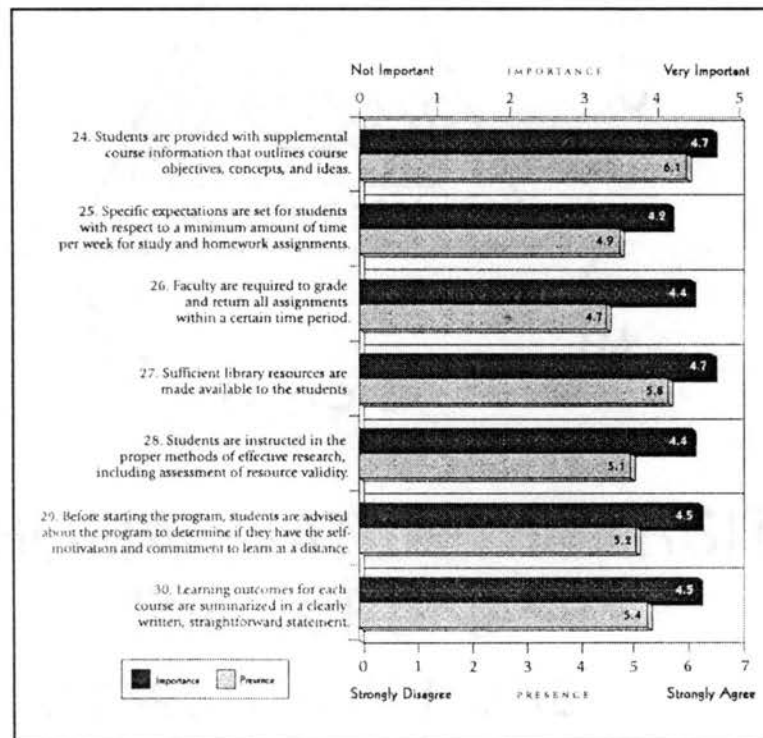


Figure 6. Course Structure Benchmarks.

- Students are provided with supplemental course information that outlines course objectives, concepts, and ideas, and learning outcomes for each course are summarized in a clearly written, straightforward statement.
- Students have access to sufficient library resources that may include a “virtual library” accessible through the World Wide Web.
- Faculty and students agree upon expectation regarding times for student assignment completion and faculty response. (p. 3)

### Student Support Benchmarks

- Students receive information about programs, including admission requirements, tuition and fees, books and supplies, technical and proctoring requirements, and student support services.
- Students are provided with hands-on training and information to aid them in securing material through electronic databases, interlibrary loans, government archives, news services, and other sources.
- Throughout the duration of the course/program, students have access to technical assistance, including detailed instructions regarding the electronic media used, practice sessions prior to the beginning of the course, and convenient access to technical support staff.
- Questions directed to student service personnel are answered accurately and quickly, with a structured system in place to address student complaints. (p.3)

Figure 7 represents the issues and the study results for Student Support.

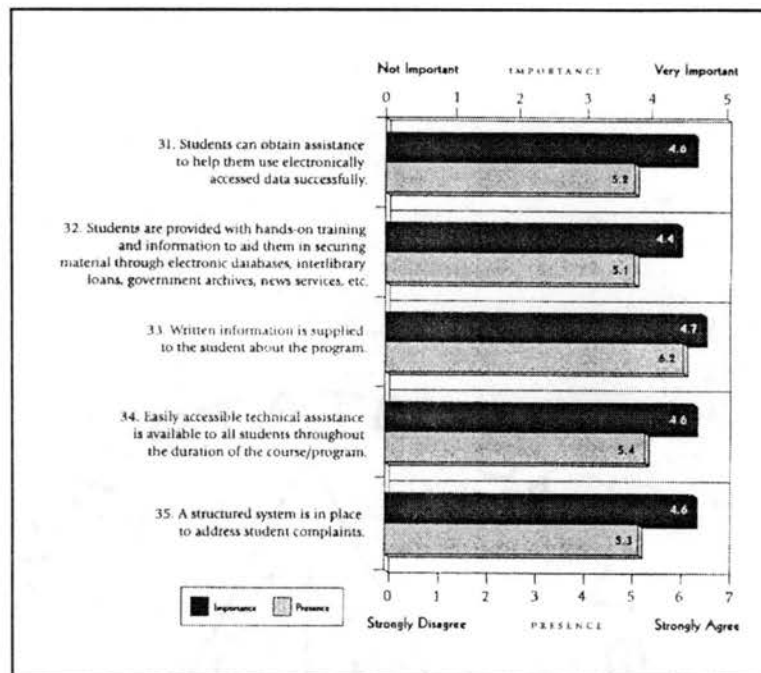


Figure 7. Student Support Benchmarks.

### Faculty Support Benchmarks

- Technical assistance in course development is available to faculty, who are encouraged to use it.
- Faculty members are assisted in the transition from classroom teaching to online instruction and are assessed during the process.
- Instructor training and assistance, including peer mentoring, continues through the progression of the online course.
- Faculty members are provided with written resources to deal with issues arising from student use of electronically-accessed data (p. 3).

Figure 8 represents the issues and the study results for Faculty Support.



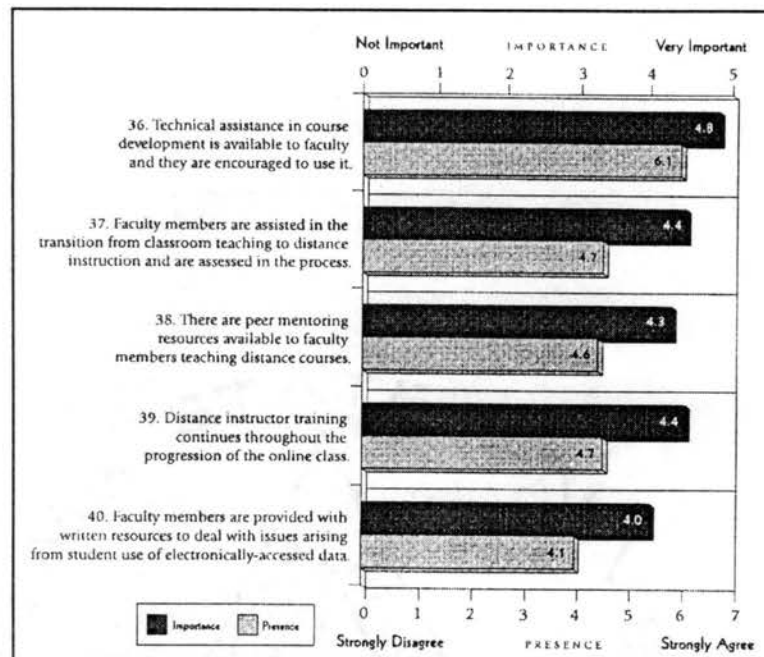


Figure 8. Faculty Support Benchmarks.

### Evaluation and Assessment Benchmarks

- The program's educational effectiveness and teaching/learning process is assessed through an evaluation process that uses several methods and applies specific standards.
- Data on enrollment, costs, and successful/innovative uses of technology are used to evaluate program effectiveness.
- Intended learning outcomes are reviewed regularly to ensure clarity, utility, and appropriateness. (p. 3)

Figure 9 represents the issues and the study results for Evaluation and Assessment.

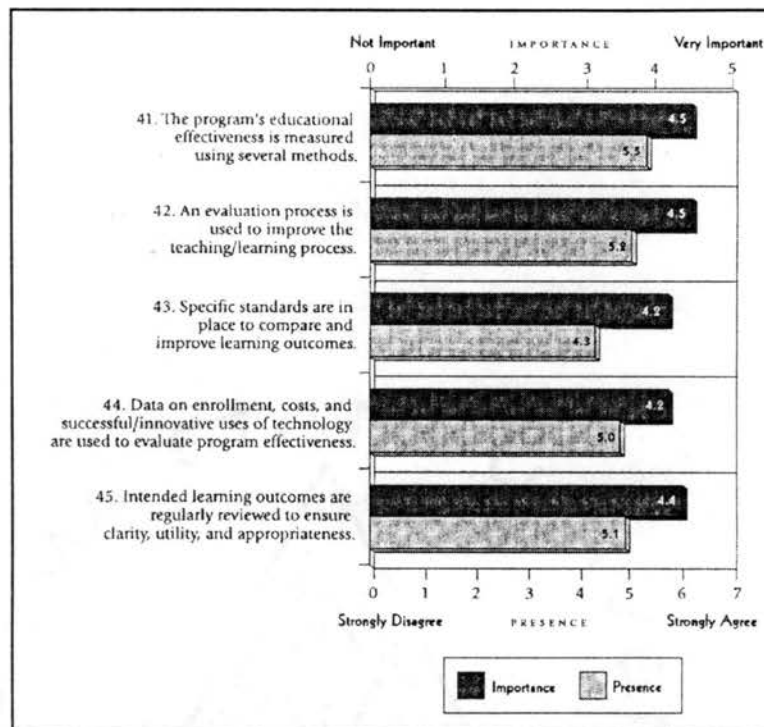


Figure 9. Evaluation and Assessment Benchmarks.

Analysis of the quality indicators at these institutions suggests that the benchmarks that are mandatory are those for which *the absence of the benchmark would detract from quality* (Institute for Higher Education Policy, 2000). The others were considered non-essential for ensuring quality Internet-based distance education. That is not to say they are not important. For example, Benchmark #1 states that *faculty are provided professional incentives for innovative practices to encourage development of distance learning courses* (Institute for Higher Education Policy, 2000). This recommendation may be the most controversial, but despite its low presence at the study institutions, quality online instruction was occurring.

## CHAPTER III

### METHODOLOGY

#### Introduction

Because of the growing popularity of the Internet as an educational delivery vehicle of choice among higher educational institutions, a determination needed to be made on which methodology works best and finally, the benchmarks of a good, Internet-based course at Oklahoma State University-Oklahoma City (OSU-OKC). This study focused on courses that are offered totally over the Internet through the World Wide Web.

#### Research Methodology

The methodology utilized in this research was a qualitative approach using document analysis of literature and a review of course databases. The reason this methodology was chosen is best summed up by Gay (1996), “. . . quantitative research involves primarily the collection and analysis of numerical data . . . qualitative research, on the other hand, involves for the most part nonnumerical data” (p 208). It is also referred to as naturalistic research based on the study occurring in a natural setting as they occur, not in an experimental or controlled condition (Gay, 1996). Qualitative research is clearly inductive, utilizing the information and data found through intensive and

extensive observation to promote a greater understanding of the subject (Gay, 1996). It was determined that this methodology would best suit the needs of OSU-OKC.

There were no personal interviews based on the availability of information in existing literature and databases. The application for review of human subjects exemption was submitted to the Institutional Review Board (IRB) at Oklahoma State University in September 2000. The IRB decided this study did not need to be reviewed based on the absence of live subjects and the general methodology.

### Procedures

This study was conducted over a period of three years starting in 1997. The information and data for this study was acquired through an analysis of literature available through the books, journals and web sites about distance education and teaching on the World Wide Web, and a review of data available at OSU-OKC focused on web-delivered courses. This study utilized a two-phase approach to gather and analyze this information.

#### Procedure: Phase I

Berg (1998) indicated that an inductive approach begins with researchers “immersing” themselves in the documents in order to ascertain dimensions or themes. This study utilized the basic concepts of this approach by first reviewing literature from journal articles, books, and web-based sources building a general knowledge of the history and types of distance education. The literature was then reviewed from the same

sources for information about web-based courses and personal insight from students who have taken web-based courses.

#### Procedure: Phase II

Phase II consisted of exploring course databases from Oklahoma State University – Oklahoma City. These databases consisted of records of past classes offered over the Internet, primarily the World Wide Web. Themes that emerged from the review of this data were compared for consistency with the themes from Phase I.

#### Data Analysis: Phase I

According to Berg (1998), the analyst begins with a procedure called open coding or open inquiring widely. This coding is best described as an unrestricted coding of the data and information found. In open coding, the analyst carefully and minutely reviews the document line by line, and word by word to determine the concepts and themes the data fits. The data and information found in Phase I strongly reflected some common themes and were compared with data found in Phase II.

#### Data Analysis: Phase II

The data and information in Phase II were analyzed and compared with the grounded theories in Phase I. According to Glaser and Strauss (1967), to generate grounded theory, it is recommended that the best approach is an initial systematic discovery of the theory from the research data. Since categories or themes are discovered by examination of the data, laymen involved in the area to which the theory applies will

usually be able to understand it and others will recognize an understandable theory linked with the data of a given area. The Phase II data proved to correspond with the data gathered from Phase I and led to the findings and recommendations in this study.

### Background of the OSU-OKC Database

Even though distance education has been in existence for many decades, the web-based, Internet format has been utilized only since 1995 at OSU-OKC.

The first course was structured in 1995 using a web page for general course information and a chat area for actual lecture. The class met virtual from 1:00 pm to 2:15 pm on Tuesdays and Thursdays. The students were usually using computers at their desk during work. The students were mostly out of state. During the chat times, the instructor lectured using the lecture notes from the traditionally taught class. This class was able to ask questions of the lecture and general questions when appropriate. Exams were online through the course web page. The course was truly synchronous with interaction between the instructor and students in real time.

The next semester, the instructor tried a more asynchronous format. All information was posted on the course web page and the students could enter at their leisure and complete assignments. There was no live chat. E-mail and discussion boards were utilized for interaction, but nothing in real time.

The following semester's course utilized the same format as the previous with one exception—scheduled live chats throughout the semester.

Oklahoma State University-Oklahoma City is currently using WebCT as an alternative to creating the course using web authoring tools. WebCT offers many

advantages by facilitating the developing and posting of a course in minimum time. It has creation tools built in with online testing and grading. The software allows for the creation of self-tests and exams that provide the student with immediate feedback of results. WebCT also has a forum area for the posting of conferences and a live chat area.

OSU-OKC is currently utilizing an on-line evaluation model included in the Appendix of this study. The questions were designed to gather data that was pertinent to the improvement of the on-line environment and closely compare to the evaluation methodology used in the traditional classroom so comparative studies can be conducted in the future.

#### Summary and Final Analysis

This research was necessary to provide benchmarks so that OSU-OKC can improve its on-line educational environment. Since providing educational opportunities over the World Wide Web is relatively new, especially for OSU-OKC, and the institution exists in a highly competitive environment, it is imperative that guidance be in place to provide all faculty an opportunity to develop a successful course. This study was conducted using document analysis consisting of a consensus of the literature and a review of course databases. The information and data discovered in this study proved to be valid based on its overall correlation with reviewed literature and databases.

## CHAPTER IV

### FINDINGS

#### General

The following findings are based on the literature and databases available at OSU-OKC. After reviewing the existing literature, there was an agreement of what attributes constituted a successful web-based course. These attributes also agreed with information gleaned from the OSU-OKC databases.

#### OSU-OKC Data

Data from the first course in 1995, the following courses, and the review of the literature provided information that will allow marked improvements in the online environment at Oklahoma State University-Oklahoma City.

In the 1995 class, students seemed to enjoy the methodology of class instruction. Class evaluations were high with nothing unusual noted except one comment during the course about the instructor “talking too much” during the chat. The instructor made note of this and ensured there were breaks in the lecture so that the students could ask questions without feeling they were interrupting.

The next semester, because the instructor tried a more asynchronous format, course evaluations were not as high as the first course using live chat.



The following semester's course utilizing the same format as the previous with one exception—scheduled live chats throughout the semester rated very high with the students. It was very obvious that the live chat component was needed for the course to be considered totally successful.

Currently, using the WebCT format, the students so far have expressed average satisfaction. Generally, the site is more difficult to navigate and the assignment posting process is somewhat confusing.

This data coupled with the literature review have provided several factors and benchmarks for a successful web-based course.

### Components for a Successful Course

After reviewing the data from all available sources, a consensus appeared that dictated the following should be considered when developing and conducting a successful course:

- Is there a need for the course to be delivered via the Internet?

An instructor should not develop an Internet course without determining whether the course will meet student needs.

- Consider the student
  - What is the technology level of the student?
  - What learning style do the students have?
  - What type of computer will the typical student in the course be using?
  - What is their connection speed?

- What type of browser will they be using?

A course developer must be concerned with these factors above all else. First, the student must have an understanding of the Internet, how to connect and how to use a browser. An instructor might want to consider an orientation session for all students in a course demonstrating how to use the Internet and the World Wide Web, how to perform searches, how to navigate through the course web site, and how to post e-mail, discussions and chat. Another option is a web site that has an online quiz about the Internet and some of the other finer points of taking a web delivered course. If the student passes it, they are ready for the course; if not, they should reconsider enrolling in an online course and obtain some more experience.

If an online course does not address most of the learning styles (if not all) of the students, the potential for student failure is great. One method of assessment is to give the students a learning style inventory prior to class, perhaps during orientation. This will help the instructor determine what type of student is in the class and facilitate positive changes to the course structure and format. The Myers-Briggs, Keirsey Temperament Sorter, the Gregorc Style Delineator or any other suitable instrument would provide information about the students' learning styles to assist in making a determination (Ross & Schultz, 1999).

White (2000) states that computer type and speed is another factor. If a student has a slow computer, below 100 megahertz and 12 megabytes of random access memory, graphics and other types of multimedia will be slow to download and initiate.

If some of the students are in rural areas then their connection speed might be slow (28,000 bps). At this speed, graphics download slowly and audio and video would

be very choppy and sometimes not download at all. The chat component would also be slow but still usable. The frustration level of the student would be very high, possibly to the point of dropping the course. If an instructor still wants to use graphics, audio and video, an option would be to develop a “text only” page which would download relatively fast.

An instructor should make sure he or she is developing a course with the lowest version of a currently available World Wide Web browser. A lower version browser will not allow certain multimedia to execute.

- Become familiar with the software tools that will be utilized in the development of the page and course overall.

If an instructor is developing a stand-alone course without the help of proprietary course development/hosting software such as, WebCT, LearningSpace, Blackboard, or CyberClass, he or she must get familiar with the software. There are many ways to create a web page with this methodology. Authoring software tools are available in both the HTML editing and the WYSIWYG (what you see is what you get) formats. The easiest method is the WYSIWYG. This method of web page development allows the instructor to use the tool like a word processor. The instructor creates the page just like he or she would create a document. No real knowledge of HTML is necessary, but the instructor should have a working knowledge of the software so he or she knows what the various buttons and menus do. If the instructor does decide to utilize course templates supplied by companies like WebCT, Blackboard, Cyberclass, Webcourse-in-a-Box, or LearningSpace, familiarity with the course developmental aspects of the software is a must.

- Utilize pre-existing information that has already been developed.

According to Gottschalk (1995), instructors should not re-invent the wheel. It is perfectly all right to use existing lecture notes or presentations. They just have to be formatted for web viewing which means they must be converted to HTML. Microsoft's PowerPoint and Word have a selection under the "file" menu that changes PowerPoint presentations and word documents to HTML automatically. Once they are converted, they just need to be posted to the host server.

- Course Home Pages should be developed so they are consistent and easy to read and navigate.

The course pages should have a consistent look. All pages should have a similar color scheme with the information easy to locate on each page. Proprietary course development systems like WebCT do this for the instructor automatically. Navigation buttons should be in the same place for each page, and each page should have a link back to the preceding page, home page, and following page. The developer should make sure that the colors and graphics used in pages allow easy reading and printing for the student. Never use a light text on a dark background. Some browsers and printers will not effectively print web pages if this is the color scheme.

The instructor should keep the web pages short. Good web page development dictates that the first page a student enters is a welcome/index page that offers links to other pages in the course. This will allow students to jump to where they want to go in the course without having to read a lot of unnecessary information.

The instructor should also maximize links to internal information and minimize links to external information. Links externally should be used only if they add to the course content or provide useful information for the student.

- Never use unnecessarily large graphics or sound/video clips.

Remember the lowest common denominator student, that student who may have a slow Internet connection and low power computer with no sound card or video card, that can't display the colors necessary for a full motion video. Excessive time waiting for these things to download does nothing but frustrate the student. The best strategy to use if audio and video are an important part of the course is to provide a text-only version web page so these students can at least read the information they are missing.

- Do not let the course pages and links become out of date.

The course pages should be updated constantly to show the student the instructor and information are current and active. The instructor should also avoid "link rot" whenever possible. This happens when the link is no longer applicable to the course or the web site has disappeared.

Now that the development or structure phase is complete, the instructor should concentrate on what kind of content the course should contain. Good web courses should facilitate the student's journey through a subject. They should provoke thought, discussion, and active participation. The following should be considered in developing content:

- Course and Instructor information

Ackermann (1996) states that the instructor should include the course topic, course objective, textbook information, grading procedures, a syllabus, and the instructor

office hours, e-mail address, phone number and a short bio including a picture. A picture of the instructor and, in fact, the participating students should be included if possible.

Adding these elements to the course web page will give it a human dimension that some distance learning courses lack.

- Course Communication

To make the course truly interactive, there are several factors that must be included in the course. The instructor's e-mail address must be included to allow the students to contact the instructor utilizing the course technology. In fact, all students' e-mail addresses should be posted somewhere so they can communicate with each other at any time. Links to forum or conferencing areas should be provided. There are several good stand-alone conferencing programs available for a small cost that will add this feature to a web course. Most proprietary e-learning programs have this feature included. A live chat area is an outstanding way to facilitate the interactivity of a course. This feature allows real time communication between students and instructor and with each other. It is recommended that the course have several live chat sessions throughout the course duration. This adds a "real" feel to the course by emulating its traditional counterpart. The chat should consist of a time for the students to get to know each other and then discussion pertaining to the course material. According to Knowlton and Davis (2000), chat discussions should be designed for success just like the course itself. There are several factors that should be considered for a chat to be successful:

- Create interaction by establishing replies and responses as important values of online discussion.

- Signify the importance of discussion by appropriately weighting its value in grading procedures.
- Clarify vague evaluation criteria.
- Establish a community based on the value of respecting classmates' privacy.
- Make students responsible for effective participation.
- Model appropriate participation.
- Synthesize students' comments to highlight key issues.
- Ask questions to encourage elaboration and clarification.
- Create opportunities for peer evaluations.
- Give continuous feedback to students.
- Provide students with practical suggestions for improving their own work.

Instructors should also respond to e-mail and other modes of communication promptly. This demonstrates to the students instructor involvement and heads off potential problems.

- Assignments and tests

All assignments and tests completed and turned in by the students should be acknowledged as received as soon as possible. Tech-savvy students realize that the Internet e-mail protocol is not completely reliable. They will be more comfortable if they know the material was received by return e-mail. Self-tests should be utilized if at all possible. This method of assessment lets the student know their level of comprehension of the material and where improvements are required. It is recommended that these tests be self-scoring and not count toward a grade. Tests/exams can be online or proctored at a

specific location. There is still much controversy relating to this subject, and no sure answer is available. The author utilizes online testing with essay type questions to determine the student's comprehension of the material. This method has proven to be viable. Proctored testing was considered, but determined too labor intensive, especially with many students taking the course from various parts of the world. If proctoring is desired, one method to be considered might be having the student list several professionals in their area, such as doctors, clergy, or the library along with contact information. The instructor would then select one of the professionals and contact them either by phone or a letter explaining the procedure and asking if they would be interested. Some schools use this with some success, but there is still no guarantee that the student who shows up to take the exam is who they say they are. This same concept applies to the traditional classroom.

- Material covered in the class

The instructor should make available all notes, lectures, handouts, and presentation on the course web site for viewing or downloading.

- Reference Material

List materials in print and electronic form that supplement the textbook. There should also be links available that relate to the course and add substance to the course content. The instructor should also be sure to use the textbook assigned. One of the more frustrating aspects of college life is buying an expensive book, and then finding out the instructor does not use it, even as a reference. Always use the materials listed in the course web page and syllabus.



## In Conclusion

Instructors have many factors to consider when contemplating an on-line course. The information provided in this study will ensure the success of delivering education via the World Wide Web by providing some useful tips and benchmarks. All of these concepts can be applied to either “free-lance” creation or using proprietary educational packages. Based on the literature and the OSU-OKC databases, probably the most important concept is the interactivity component. The more communication the instructor has with the students and they have with each other, the more rewarding the course will be. An instructor should build a sense of community in the on-line class.

## CHAPTER V

### SUMMARY, CONCLUSIONS AND RECOMMENDATION

#### Summary

Distance learning has been available to the public for many years, but nothing compares to what is available today due to existing technology. What started out as written correspondence courses has evolved to multimedia events. Because of the technological tools available today, anyone can develop a web course in a matter of hours versus the weeks and sometimes months it took a few short years ago.

Societal demands have placed a need on higher education that should be heeded. Institutions of higher learning that do not hear the call will find themselves losing students to those who do.

The typical students in distance learning courses are adult learners. They generally find distance learning, especially web-based courses, rewarding experiences, if they are developed and conducted with the student in mind. The students usually take the course because of the convenience. These courses allow them to improve themselves or further their education at their leisure. The courses are usually not limited to time and space and also allow institutions to reach those that are constrained by such.

The instructor/developer should be aware that not all potential students will be successful taking a web-based course and should take measures mentioned in this study to

ensure student success. Individual learning styles of the students should be ascertained before the class starts to ensure each student has an equal opportunity. An orientation either on-line or live before the class starts will provide an opportunity to gather learning style information from the students as well as addressing some of the key points of the class. They should also develop and conduct the course with the elements of this study in mind. The instructor/developer has many tools available to assist in the development of a web-based course and should not be shy when asked to consider it.

### Conclusion

The face of education is rapidly changing. Those who elect to bury their heads in the sand will miss the opportunity to touch the lives of many. Technology is driving easy access to knowledge. The future holds many exciting possibilities for not only the student but the academe as well. Imagine having the knowledge of mankind at your fingertips and the instructional vehicle to facilitate learning it as well. Information will be instantaneous. It is up to the academe to prepare the pathway to it.

Institutions should not shy away from this instructional methodology just because they feel it is an end to brick and mortar classrooms or it is not educationally viable. There will always be a need for face-to-face interaction, and some courses are just not suited to the Web environment. Studies also show that students learn as much, if not more, from web-based coursework.

Institutions should utilize this technology to reach those they could not before . . . those who are time or physically bound from completing or furthering their education.

This form of instruction is not the end of higher education as we know it, but an alternative to reach and educate the world.

### Recommendations

It is recommended that Oklahoma State University-Oklahoma City as well as other institutions further research the potential for online education and provide resources to familiarize professors with its multiple facets. It is not simply “putting up a website”. There are many factors to consider and many ways to frustrate the professors and stymie the students’ learning experience.

To assist in proving whether these factors will ensure a successful web course, all courses should be evaluated using the on-line form in the Appendix, or some variation of it. The data from these evaluations will not only further prove the validity of these benchmarks, but will ultimately provide a template for others to follow. The evaluation can be further enhanced by adding questions specific to the web environment. Questions such as; was the course web site easy to navigate, and was the course server easy to access, will improve the overall on-line, educational experience.

If the institution incorporates the factors and benchmarks of a successful web course laid out in this study, it will be well on its way to establishing an online presence that will be considered the best in the state of Oklahoma.

### Recommendations for Future Research

The Internet is a dynamic, ever-changing environment. Most of this is driven by technology and as the capability of the Internet increases, so should ways to exploit it for

education. It is recommended that research continue comparing the traditional classroom environment with Internet-based delivery to ensure quality of education at OSU-OKC and other educational institutions. New World Wide Web technology should also be constantly tested to determine applicability to the learning environment.

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## APPENDIX

## Introduction to Total Quality Course Evaluation

Answer the questions below and then click "submit" to send your answers. Please DO NOT include your name and other personal information. This evaluation is strictly anonymous. Thanks and have a GREAT SUMMER!!

---

### 1. Availability of course materials

Your answer:

- Excellent
  - Above Average
  - Satisfactory
  - Needs Improvement
- 

### 2. Usefulness of required text.

Your answer:

- Excellent
  - Above Average
  - Satisfactory
  - Needs Improvement
- 

### 3. Availability of syllabus when course started.

Your answer:

- Excellent
  - Above Average
  - Satisfactory
  - Needs Improvement
- 

### 4. Communication of course requirements.

Your answer:

- Excellent
  - Above Average
  - Satisfactory
  - Needs Improvement
- 

### 5. The course objectives were specified and followed.

Your answer:

- Excellent

- Above Average
  - Satisfactory
  - Needs Improvement
- 

**6. Level of intellectual challenge presented by this course.**

Your answer:

- Excellent
  - Above Average
  - Satisfactory
  - Needs Improvement
- 

**7. Relevance of course assignments and activities to exams.**

Your answer:

- Excellent
  - Above Average
  - Satisfactory
  - Needs Improvement
- 

**8. Expertise of instructor in course material.**

Your answer:

- Excellent
  - Above Average
  - Satisfactory
  - Needs Improvement
- 

**9. Instructor solicited and respected student's input.**

Your answer:

- Excellent
  - Above Average
  - Satisfactory
  - Needs Improvement
- 

**10. Timeliness in return of tests/quizzes/papers.**

Your answer:

- Excellent
- Above Average
- Satisfactory

Needs Improvement

---

**11. Organization and preparation of instructor.**

Your answer:

- Excellent  
 Above Average  
 Satisfactory  
 Needs Improvement
- 

**12. Availability of instructor for questions and assistance.**

Your answer:

- Excellent  
 Above Average  
 Satisfactory  
 Needs Improvement
- 

**13. Instructor's explanation of difficult concepts.**

Your answer:

- Excellent  
 Above Average  
 Satisfactory  
 Needs Improvement
- 

**14. Use of outside materials to supplement textbook.**

Your answer:

- Excellent  
 Above Average  
 Satisfactory  
 Needs Improvement
- 

**15. Instructor's use of required text.**

Your answer:

- Excellent  
 Above Average  
 Satisfactory  
 Needs Improvement
-

**16. Discussed grading criteria clearly.**

Your answer:

- Excellent
  - Above Average
  - Satisfactory
  - Needs Improvement
- 

**17. Exam material relevant to course**

Your answer:

- Excellent
  - Above Average
  - Satisfactory
  - Needs Improvement
- 

**18. Relevance of other work required for course grade.**

Your answer:

- Excellent
  - Above Average
  - Satisfactory
  - Needs Improvement
- 

**19. Would you recommend this course to another student?**

Your answer:

- Yes
  - Not Likely
  - Very Unlikely
  - No
- 

**20. Would you recommend this instructor to another student?**

Your answer:

- Yes
  - Not Likely
  - Very Unlikely
  - No
- 

**21. Would you take another course in this subject area/discipline over the Internet?**

Your answer:

- Yes  
 Not Likely  
 Very Unlikely  
 No
- 

**22. Level to which your knowledge/skills about the subject of this course increased.**

Your answer:

- Excellent  
 Above Average  
 Satisfactory  
 Needs Improvement
- 

**23. Please write any additional comments.**

Your answer:

---

Name:

Full email address:

Class:

**NOTE TO THE STUDENT:** If the answers are sent successfully, you will see another page come up in the web browser. If you don't see this page, it is possible that an error occurred during transfer and you should either resubmit your answers or notify your instructor.



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# VITA<sup>2</sup>

Michael Lee DeLong

Candidate for the Degree of

Doctor of Education

Thesis: BENCHMARKS FOR A SUCCESSFUL INTERNET DELIVERED COURSE  
AT OKLAHOMA STATE UNIVERSITY-OKLAHOMA CITY

Major Field: Applied Educational Studies

Biographical:

Education: Graduated from Northeast Lauderdale High School, Lauderdale County, Mississippi, May 1972; received Associates in Avionics Technology from the Community College of the Air Force, July 1987. Received Bachelor of Arts in Human Resource Management from Southern Nazarene University, Bethany, Oklahoma in August 1990; received Master of Arts in Management from Webster University, St. Louis, Missouri in December 1996; completed requirements for the Doctor of Education degree with a major in Applied Educational Studies, Oklahoma State University, Stillwater, Oklahoma in December, 2000.

Experience: Twenty years in the U.S. Air Force. Rank included E-2 through E-7. Master Sergeant, assignments included avionics navigation and communication maintenance technician, avionics quality inspector, shift supervisor, production supervisor, shop chief, chief of staff for squadron commander, training manager, and wing Quality Management trainer and consultant. Received awards such as, NCO of the Month, NCO of the Quarter, 2 Commendation medals and 1 Meritorious Service medal. Since 1994, at Oklahoma State University-Oklahoma City serving as coordinator for quality and management training seminars, Quality associates degree coordinator and instructor, Assistant Professor in Quality Management and Computers, and currently, Assistant Professor and Department Head of Business Administration, and a consultant in Total Quality and computers.

Professional Memberships: Delta Mu Delta Business Honor Society, American Society for Quality, North Metro Area Council of the Greater Oklahoma Chamber of Commerce, Oklahoma Association of Community Colleges.