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# Educational technology: An online tutor training course

CD Jackson Jr.

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EDUCATIONAL TECHNOLOGY:

AN ONLINE TUTOR TRAINING COURSE

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A Project

Presented to the

Faculty of

California State University,

San Bernardino

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In Partial Fulfillment

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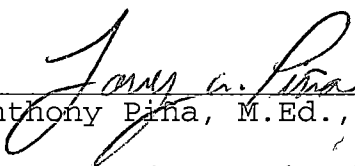
Instructional Technology

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by

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December 2002

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Approved by:

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## ABSTRACT

The goal of this online tutoring course project is to institutionalize an online tutoring training course. This instructionally designed model will target College of the Desert students serving as tutors. The students taking this course will generally be freshmen and sophomore students. A questionnaire was used to determine what the needs would be in order to build the online course.

To create the online tutoring course, the following hardware was used: e-machine 350 at home, Dell Computers at CSUSB and COD, Hewlett Packard 970 CXI Desk Jet printer, and the Sony MVC 0700 Digital Camera. Microsoft Office 2000 was used for software.

There were 20 tutors who evaluated the course. Out of the 20 participants, 10 were math and science majors, 4 were from foreign language, 3 were from English, 2 from business and 1 from history totaling 20.

The results of the survey were positive and important to COD's tutoring program. It begins a new era where online tutor training will become the norm, and it allows the program to expand by offering tutoring online.

## ACKNOWLEDGEMENTS

To my beloved late pastor and wife Reverend Edgar R. Edwards and Vivian Edwards, I love you! For when I was a child you gave me the inspiration to learn and to love. You also taught me that each one teach one. I do that today! Pastor Edwards, I recall a vivid prophecy that I made to you. You told me that you had earned two Master's degrees. I thought that was so impressive that I stated to you that I would do the same. I never thought about what I had said until I finished this thesis and project to earn a second Master's degree. It hit me like a brick in the head! So I dedicate this one to both of you as you smile down from above. I love you, and I will be joining you in future times. Peace out and straight ahead!

# TABLE OF CONTENTS

LIST OF TABLES

# LIST OF FIGURES

viii

CHAPTER ONE

INTRODUCTION AND CONTEXT

Schuyler (1997) discussed how the current teaching paradigm is fading away with the wave of new technologies through computers, the Internet, satellite cable, and high tech systems. This idea spells out the fact that students will spend less time sitting in front of an instructor listening to lectures. They will also be less confined to learn from a structured curriculum where Eurocentristic philosophies have dominated the thinking of the day. Schuyler (1997) also mentioned that teaching strategies, methodologies, and philosophies will be altered too, and practically everyone in the system must be retrained to utilize high tech systems in their institutions for learning. Further, the transition from the current teaching model to a new one has been thrusted upon us not only by the change in technology, but by the federal government, the state, business, and industry. More and more one can see new online courses being developed and offered in all areas in society from business to education. Because of the new way we obtain information electronically through the Internet, the new literacy has become computer literacy. At this current stage we are in

the middle of a mixture of the old technologies with the new (Schuyler, 1997).

Gier and Hancock, (1996) in College Reading and Learning Association's Tutoring Training Handbook (CRLA) stated that learning centers with all of the various functions, including reading labs, remedial English and reading, writing labs/centers, assessment/placement activities, computer assisted instruction labs, independent study mini-courses and supplemental instruction labs, are supported and strengthened by tutorial services. In essence, tutoring is the foundation to every learning center. In addition, they stated that having an excellent tutor-training program is meaningful and brings pride and credibility not only to the center, but also to the institution (Gier & Hancock, 1996).

Tutor training at College of the Desert (COD) is traditional; it takes place on site. The Tutorial Coordinator is responsible for all tutoring activities and it has become more difficult to train and maintain other duties. Tutors at College of the Desert receive training using videotapes, on the job training, and workshops. Information about how to become a tutor, how to receive tutoring, tutee request forms, tutor applications, assignments, syllabus, and schedules are also obtained on

2

campus. So it is necessary to have someone on the site at all times to ensure that tutors and tutees alike receive quality information and tutorial service.

Brey's (1991) report of the US postsecondary distance learning programs predicted that the decade of the 1990's would see tremendous growth in distance education programs. The majority of this growth would take place in community colleges. In 1994 it was reported that 80% of the community colleges in the US were offering online courses (Brey, 1991).

Empirical studies show that: 1) Online courses are as demanding as traditional ones; 2) Students who take online courses online back-to-back are much better prepared than the student taking the same course than the ones taking it traditionally; 3) Students with previous online experience choose the online course when given the choice; 4) Student satisfaction is the same for online and on site (Ridley & Sammour, 1996).

COD's tutoring program is continuing to expand. We have built two new buildings, created new labs, received new grants, and all of them have tutoring as a major component. Further, we have experienced the largest enrollment in the history of the college, and more tutorial services are needed. This increase requires us to

hire and train more tutors on a continuous basis. And
what's more, the turn over rate for tutors is high because
we are a two-year institution. So it has been decided that
the best way to rectify the problems mentioned above was
to design an online tutor-training course. The old model
required 4 hours of class time and 12 hours of practicum.
Practicum allows tutors to work on a probationary level,
and receive on-the-job training. The tutor-training course
is also set-up to work around the tutor's schedule, so the
Tutorial Coordinator had to teach those 4 hours at
different times for different students. It was difficult!
The new model requires tutors to meet with the Tutorial
Coordinator during the first class meeting to explain the
online course. Afterwards, they are responsible to
complete the assignments and projects prescribed on the
Internet. The online course has allowed me to schedule my
time more effectively. The following figures will
demonstrate the old (figure 1) and new (figure 2) course
models.

# Tutor Training
## Old Model

| | |
|---|---|
| Meet with Tutoring Coordinator | Register for tutor training. |
| Practicum – Begin Tutoring | View 3.5 hours of video tapes |
| Write a report on videotapes | |
| Observation. | Evaluation. |
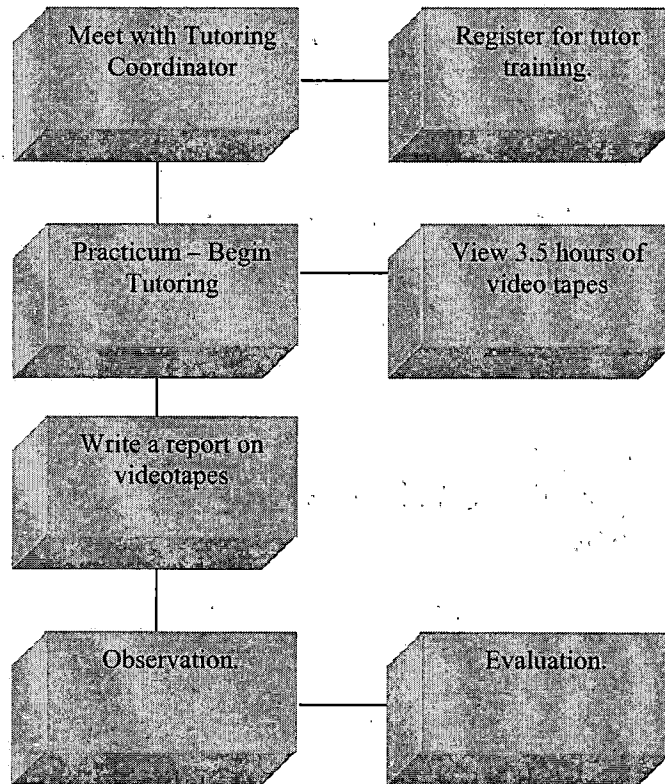
Figure 1. Tutor Training Old Model

Figure 2. Online Tutor Training New Model

## Problem Statement

There is a tutor-training program in place. The program utilizes videotapes, classroom instruction, and practicum where tutors do the actual tutoring under the observation of the Tutoring Coordinator. It is very time consuming to teach and train quality tutors while attempting to run my program with all of its responsibilities. The need is great to have a constant training activity for potential tutors.

Online courses are classes that are offered electronically through the Internet. The requirements to take a course are to have a computer with a modem, have an Internet provider, and basic skills as to how to use the software programs for the online course.

There are many telecommunications technologies being used at College of the Desert. As Tutorial Coordinator, I handle tutoring for every school and department within College of the Desert's structure. My tutoring operation takes place in our Academic Skills Center (ASC). It houses five basic operations: assessment testing, math lab, writing lab, foreign Language lab, and the tutoring center. The ASC and the entire school are wired with fiber optics. Each lab has data ports to connect computers for

Internet access, and T-1 lines are also used for maximum
speed. Coaxial ports have also been installed for
satellite and cable usage, so COD is equipped to handle
almost any telecommunication technologies.

The ASC building is connected to a server. It has
four large rooms where each lab is computer based. We have
purchased site licenses to run and operate Office 2000,
Microsoft Network, Netscape, and a host of other software
programs from a variety of disciplines. Office 2000 and
MSN, and Netscape are run through the Internet. Our
Internet provider is located in Palm Desert; the company's
name is Blueberry Hill Communications, Inc.

In the past few years, College of the Desert's
tutoring program has grown tremendously. Eighty percent of
students who matriculate to COD from high schools from
around the Coachella Valley must enroll in English 50,
Reading 50, and College Math 57. These courses are the
lowest remedial credit classes that we offer, and they
come with a mandatory lab. The lab work does not always
provide a sufficient amount of strategies and techniques
for some students to increase their skills. They need
personal attention. We have special programs like:
Extended Opportunity Program (EOPS), Academic Counseling
Educational Services (ACES), Disabled Student Program

Services (DSPS), and the CARE program for single parents that provides one-on-one tutoring for these students. EOPS, ACES and DSPS are comprehensive support services programs given to qualified students to help them meet their educational needs. I have so many requests for one-on-one tutoring that I do not have the trained personnel to handle them.

The evidence produced thus far about the history of tutoring, distance education, technology, and College of the Desert's tutoring provides the rationale for the development of an online tutoring training course. This will provide my program with the ability to offer quality informational training 24 hours a day, seven days a week, and 365 days a year.

## Purpose and Significance of the Project

For my Master's project, I designed an online tutoring training course. The online course was designed to allow tutors the opportunity to study about the different aspects of tutoring online. There are many concepts to discover such as the history of tutoring, study skills, learning styles, cultural differences, learning disabilities, and group tutoring. The course also has several projects for tutors to work on in each

category mentioned. This kind of activity can be done collaboratively or individually. Additionally, the course has an evaluation tool, a discussion board, course tools, orientation, a syllabus, and links to other important web sites.

CHAPTER TWO

REVIEW OF THE LITERATURE

History of Tutoring

What is tutoring and what is its history? Tutoring is the most misunderstood term in education. In the book Centuries of Tutoring the Gordons give a thorough explanation about what a tutor is and its history. They explained saying: Tutoring has made a significant contribution in the history of education regarding the evolution of schooling. Today, we view the schools as being synonymous with education. This is not always true. There is much evidence that a sizable amount of education took place in the home using one-to-one instruction by a variety of tutors, including parents. Some of the most important educational theories based upon the West developed educational experience as tutors, rather than as schoolteachers. Their philosophy developed into many of our modern educational principals (Gordon & Gordon, 1990).

Chafy's research corroborates with Gordon and Gordon idea. He notes the following: Throughout the Middle Ages, the Renaissance, and the Reformation, nearly all technological innovations took place on an individual craft basis: knowledge was transferred from generation to

generation by apprenticeship. Significant technological advancements, such as the clock, the horizontal axle windmill, gigantic Gothic cathedrals, the printing press, and better guns and ships, were being developed outside of the universities (Chafy, 1997).

According to the Gordons, anonymous individuals whose obscure work evaded public recognition reported much of the history of tutoring. Our past ignorance of their work left modern educators with an incomplete picture. We continue to portray tutoring as an exclusive elitist form of education available for a few scholars.

In ancient times, a tutor was expected to be more than one who assisted an individual with classroom instruction. The Egyptians, Sumerians, Indians from India, and Chinese are known to be the most ancient of civilizations. They have a history dating back to 5000 BC. The Greeks began to develop their civilization around 750 B.C. There is a tradition that Cadmus introduced into Greece the letters of the alphabet that were invented by the black Phoenicians (Bulfinch, 1998, p. 89). The most notable tutors in Greek history were Socrates (469 B.C.-399 B.C.), Plato (427 B.C.-347 B.C.), and Aristotle (384 B.C.-322 B.C.). Socrates was known for his brilliant way of creating dialogue with his tutees.

Today, in tutoring, we use the term Socratic method, that means to ask a leading question that requires more than a yes or no response. Plato, a tutee of Socrates, used his methods and formed his Academy in Athens. He wrote The Republic and is known around the world for documenting information about Atlantis and Free Egyptian Masonry. Aristotle was sought out by King Phillip of Macedonia to tutor his son Alexander the Great. Aristotle worked with Alexander for four years, and after King Phillip's death Alexander conquered many parts of the Western world. Plutarch observed that Alexander had a great love and respect for Aristotle his tutor (Gordon & Gordon, 1990, pp. 14-17). History has noted that Pythagoras, Plato, and Aristotle studied many years in the African nation of Egypt because there were no colleges or universities in Europe at that time (Rogers, 1996).

Tutoring: The Foundation of an
Academic Profession

Hofstadter (1955) stated that during the 17th and 18th centuries, tutors formed the primary teaching staff at Harvard. On the contrary, historians have described tutors as not being committed to teaching, dating the ascension of professional faculty to the 1750's. This is a great understatement because tutor stability at Harvard

began to appear in the 1690's. In fact, the general make-up of the Harvard tutors was part of the major changes in Anglo-American education. The change created a separation of the teaching profession from that of the ministry (Hofstadter, 1955). Burton (1995) suggests in his study that professionalism of the teaching staff at Harvard was established around the same time law and medicine developed in New England. In fact, tutoring should be considered as part of the creation of a teaching profession that included schoolteachers and grammar school masters (O'Day, 1982).

Ptacek, (2002) says that in the 17th century in Colonial New England, education was legislated by the state on the grounds of religion in the home by the head of household. In 1641, the General Court of Massachusetts requested the church to "make a Catechism (oral instruction) for the instruction of youth for religious purposes. In 1642, Massachusetts enacted a law, which stipulated that head of households must teach their children to read. They were also required to teach them civil law. The General Court of Massachusetts also passed a law in 1647, which ordered townships with at least 50 households to appoint an individual to teach all children

to read and write. Towns of more than 50 were obligated to build a grammar school (Ptacek, 2002).

In 1650 the Connecticut River colony passed similar legislation, which required the heads of households to teach children to read. New Haven and Plymouth Colonies followed in 1655 and 1671 (Ptacek, 2002).

The public school system was based on Christian ideas right from the start (Ptacek, 2002). The majority of schoolmasters were Christian ministers. Richard Mather, the grandfather of Cotton Mather, one of the most celebrated American Congregational ministers and author in New England, served as a schoolmaster. The distinguished Cotton Mather entered Harvard at age 12. His father Increase Mather was Harvard's president when Cotton graduated at age 18 with an M.A. degree. Puritan Calvinists founded Harvard in 1636. This gave New England hope of finding qualified teachers (Burton, 1995).

Colonial Harvard employed two types of instructors: professors and tutors In the 1720's, professors taught in specific disciplines and lived off-campus. Tutors, from the 1640's were responsible to teach the entire basic curriculum. The law in 1734 "specified professors shall constantly reside" in Cambridge near the college. Prior to the Industrial Revolution, Harvard professors lived on

Harvard grounds on the east end of the campus. Professors were able to marry. Tutors were expected to remain single. Tutoring in the 17th century was completely different from 18th century tutorship; it was much more professional, and mimicked today's college teaching (Burton, 1995).

Smith discussed the transition that tutorship went through from 17th to 18th century. In the 17th century tutors had tenure for three years. Eighteenth century tutors continued to be employed for fifteen or more years. All of the 17th century tutors were waiting to receive acceptance into the ministry while 18th century tutors went into other areas of study. In the 17th century, tutors collected money from tutees, but in the 18th century, tutors received guaranteed payment from administration. Lastly, Smith made it very clear that college teaching was not a profession in the 18th century (Smith, 1966).

Chairs and professorships were not endowed until 1772. Tutors were hired based upon their good behavior. They were assigned two classes and were responsible to teach the entire undergraduate curriculum. They were also given much authority. From 1642-1646 the Laws and Liberties and Orders of Harvard College gave tutors the responsibilities to supervise religious supervision of

students, conduct in commons, and in their chambers. Tutors held the power to assign housing, and give students permission to attend public civil meetings. They also had the power to take action against students who lived off campus illegally. This was done through admonition and private corrections. In addition, they administered corporal punishment. Ultimately, the tutors were responsible in supervising all student activities (Burton, 1995).

Morison (1936) explains that in the 17$^{th}$ century tutors were under 25 years of age. They held a Bachelor's degree while waiting as a candidate for the ministry. All Harvard presidents were ministers, and almost all tutors were ministers-in-waiting. Seventy three percent of Harvard's tutors became ministers after graduation.

Near the beginning of the 18$^{th}$ century, Harvard's strict Puritan theology began to lose ground. New ideas were introduced, and it took off like a wild fire. Tutors and their increased power and authority during political conflict with the crown (England) made the change possible. The crown annulled Harvard's charter in 1685. There were five charters issued by the General Court between 1692 and 1700's; the crown rejected all five. Tutors John Leverett and William Brattle's had great

influence on the intellectual changes that took place during the political turmoil with England (as cited in Burton, 1995).

Burton (1995) says: Harvard tutors were the leaders of the intellectual revolution at Harvard that moved the curriculum away from an exclusively classical education designed for the theological education to a more humanistically-oriented education that could encompass training for a wide variety of professions. These curricular changes in turn helped to separate college attendance and college teaching from the ministerial profession. The changes helped to bring secular curriculum, and students had a choice to select a major outside of Church doctrine. By the mid 18<sup>th</sup> century, tenure as a college tutor would be valued as preparation for careers in law, business, and school teaching.

18<sup>th</sup> century tutors and professors were older than 17<sup>th</sup> century ones. They were hired in their late twenties and early thirties. Both were appointed times to complete their fellowships, and almost all of them had master's degrees. Many of the tutors were hired as librarians or butlers at the college. This gave them keen insight about college operations (Sibley & Shipton, 1800).

18

In the late 1720's, professors were endowed with tenure. However, they were excluded from the Harvard Corporation, where senior tutors were not. In fact, between 1720 and 1760, tutors on the Corporation selected and elected professors to their chairs. In the 18th century, no more than one professor served on the Corporation at any given time (as cited in Burton, 1995).

As new professors were hired, conflict between tutors and professors occurred. As I mentioned earlier, tutors had administrative duties where they supervised students' lives on and off campus. They were a part of the Corporation selecting and electing professors. Being equaled to schoolmasters, tutors were also noted for their professionalism. Professors on the other hand were confined to teaching a particular discipline without any authority to govern students. They had no administrative power. Once faculty chairs and an Outside Corporation were engendered, the Harvard authorities began to reduce tutor authority and its professional status (Burton, 1995).

The 18th century again brought a change for tutors and professors. Because both professors and tutors were losing power, they formed a corporation; they became Harvard's faculty. There was no distinguishing between the two parties. Both positions were considered equal, and in

1775, they began meeting having an equal voice. In 1766, tutoring at Harvard was reconstructed. Tutors no longer taught students the entire undergraduate curriculum; they were reduced to tutoring a single subject. Today this idea of tutoring a particular subject has become a standard in the K-12, college and university systems.

A Brief History of Mass Education

The Industrial Revolution and the modernization of nations created the model called "mass education." For the past two centuries Great Britain, France, Germany, and the United States were the forerunners in developing it. In 1791-92, Antoine-Nicholas de Condorcet presented a plan for a universal form of education to the French Legislative Assembly, proposing a complete national system of secular schools to provide equal opportunity for all children, free, compulsory, and universal. He also wrote a paper entitled, Sketch for a Historical Picture of the Progress of the Human Mind. In it, he argued that the human mind must progress from irrationality to rationality, from superstition to reason, from pre-scientific thought to scientific enlightenment. The educational system they built helped realize Condorcet's

idea of mass education with a technology orientation (Chafy, 1997).

President Thomas Jefferson, former ambassador to France, supported a free state-supported educational system for its citizens, and science was a key component of it. He also submitted a plan to Congress and it was rejected. Although Jefferson believed in freedom, justice, equality, and mass education for all, he did not include African Americans, women, and other minority groups. It was intended for white males only. By the middle of the 19th century Horace Mann and others began to call for a public education system. The response was to Jefferson ideals. By the latter part of the 19th-century John Dewey revolted against elite classical education, and Church dominance. Dewey's philosophy was based on logical reflective thought and objectivity. He believed that everything was subject to objectivity including morality, values, as well as scientific thought (Chafy, 1997).

Women also played a major role in education. Spring (2000) discussed Emma Willard, founder of the Troy Female Seminary, whose main purpose was educating teachers, declared the saving grace of female teachers. It was a sentiment of the times that women teachers would be the guardians of morality in America. Catherine Beecher

recruited female teachers through the Board of National Popular Education. It was her intention to civilize the West. After the Civil War, many women went to the South to assist in bringing social rights and political change for freed blacks. With all of the great intentions that women had to give instruction, they were treated as second-class citizens. They were also paid less than male teachers (Spring, 2000).

The Constitution of the United States of America does not mention education. Thus, education is a power reserved to the states. A school district is a legal creation of the state. After World War I, teachers were asked to promote 100% Americanism against fascist and communist ideas. It was during that time that teachers had to take an oath of allegiance (Spring, 2000).

During the 1950's American schools were called upon to win the technology race because America was falling behind the Russians in the arms race and the conquest of space. The sixties, through the Civil rights protests by Dr. Martin L. King, Malcolm X, Fanny Lou Hamer, and millions of Americans, forced the government to sign into law the Civil Rights Act of 1964 under President Lyndon B. Johnson's Great Society. This enactment forced school desegregation, and the Brown v. Board of Education of

Topeka in 1954, could now be realized, and the Plessey v.
Ferguson decision in 1895 that created the "separate but
equal doctrine" in America was abolished. The 1970's and
80's brought us inflation; gangs, drugs, high
unemployment, more prisons, and schools became infested
with violence. The 1990's brought a new way of thinking in
our schools because of the advent of high-tech systems,
the Internet, and new technologies being phased into every
aspect in society (Spring, 2000).

A Brief History of the Computer

Prehistory: The first computer was a simple counting
aid called an abacus. Many attribute its discovery to
China, but it has been said that it may have been invented
in the fourth century in Babylonia. The Antikythera
mechanism, used for registering and predicting the motion
of stars, and planets, is dated around the first century
B.C. (Cringely, 1995).

History: Cringely (1995) reported that Wilhelm
Schickard invented the first mechanical calculator in
1623. In 1642, Blaise Pascal built a mechanical
calculator. Joseph-Marie Jacquard invented an automatic
loom controlled by punch cards. Charles Baggage tried to
develop a Difference machine in 1820. The first

calculating machine, which was produced in large numbers, was invented by the Frenchman Thomas de Colmar in 1820. His machine, which was based on a "stepped drum" mechanism, had many clones and was produced as late as 1920. It was called the "Arithmometer." The next generation of calculating machines came from a Swedish inventor Willgodt T. Odhner. Robert Pelham, 1859-1943 invented a pasting machine, a tabulator that was used in the census count of manufactures, and a tallying machine that used to count populations (Brodie, 1993). There were hundreds of manufacturers, which produced an amazing variety of calculating machines up to the late 1960's. Only then did they surrender gracefully to the appearance of the electrical calculating machine and later to the electronic computer. Adding machines were primarily designed to perform addition and subtraction. They were small, cheap and easy to use. Calculating machines were primarily designed to perform all basic four operations: addition, subtraction, multiplication and division. They are lager machines, which required skillful operation and due to their expensive price were usually owned by companies (Kaplan, 2002).

Electronics: Konrad Zuse, a German engineer, completed the first general-purpose programmable

calculator in 1941. Colossus, A British computer used for code breaking, was operational by December of 1943. Bell Telephone Laboratories developed the transistor in 1947. The Universal Automatic Computer was developed in 1951. The Electronic Discrete Variable Computer was completed under contract for the Ordinance Department in 1952 (Cringely, 1995).

Mini Computer: Texas Instruments and Fairchild semiconductor both announced the intergraded circuit in 1959. The IBM 360 was introduced in April of 1964 and quickly became the standard institutional mainframe computer. Doug Engelbart demonstrated in 1968 a word processor, an early hypertext system and a collaborative application. Gordon Moore and Robert Noyce founded Intel in 1968. Xerox created its Palo Alto Research Center in 1969. Fairchild Semiconductor introduced a 256-bit RAM chip in 1970. The same year Intel introduced an IK RAM chip and the 4004, a 4-bit microprocessor (Cringely, 1995).

Micro Computer: Bill Gates and Paul Allen formed Traf-O-Data in 1971 to sell their computer traffic-analysis. At the same time, Steve Jobs and Steve Wozniak were building and selling blue boxes in Southern California. Jonathan A. Titus designed the Mark-8, "Your

Personal Minicomputer. Popular Electronics featured the MITS Altair 8800 on its cover January 1975. It was hailed as the first "personal" computer. Bob Kahn and Vint Cerf developed the basic ideas of the Internet in 1973. Jonassen 's definition of the Internet is: a world wide network of networks composed of thousands of smaller regional networks connecting millions of users in more than 90 nations around the globe (Jonassen, 1999, p. 20). Paul Allen and Bill Gates developed BASIC for the Altair 8800. Microsoft is born. By 1980 Apple has captured 50% of the personal computer market. In 1980, Microsoft develops BASIC for IBM's personal computer project. It was released in 1981. Transmission control Protocol and Internet Protocol (TCP/IP) was established as the standard for ARPANET in 1982. The Apple Macintosh debuts in 1984 with an 8MHz, 32-bit Motorola 68000 CPU. Microsoft Windows was introduced in 1985. Microsoft sales reached $1 billion in 1989. In 1989, Tim Berners-Lee developed the World Wide Web. The World Wide Web is officially described as a wide-area hypermedia information retrieval initiative aiming to give universal access to a large universe of documents. It is also described as the sum of all documents stored using a multimedia format and made accessible via the Internet (Jonassen, 1999, p. 23). CERN

released the first Web server in 1991. In 1992 Internet

hosts reached 1 million. Presently colleges, universities,

and schools around the world have incorporated the use of

computers and the Internet into their curriculum

(Cringely, 1995).

## Intelligence in Education

When we discuss tutoring in relations to technology,

software, online and the Internet, we must begin as the

creators of technology and software did by defining and

discussing intelligence. The Merriam Webster Collegiate

Dictionary (1994) says that intelligence is: 1) The

ability to learn or understand or to deal with new or

trying situations; 2) The ability to apply knowledge to

manipulate ones environment or to think abstractly as

measured by objective criteria; 3) Information news;

4) Comprehension. In Buiu (1999) document resume she

states that there are three philosophical theories on

intelligence, theories they call existence theories:

1) Intelligence is a nonphysical property of living

organisms, and cannot be re-created in a machine;

2) Intelligence is an emergent property of organic matter:

silicon is inadequate, but when we learn how to build

machines out of organic compounds, we have a chance of

inducing intelligent behavior; 3 Intelligence is a functional property of formal systems, and is completely independent of any physical embodiment (Buiu, 1999)

The first theory sounds very much like Jewish, Christian, Muslim, and other religious thought where an individual has a brain (neurons, etc.) that connects to the mind (consciousness) or God who gives us understanding. It also compares well with dualism. Fieser (2002) states that Thomas Hyde around the beginning of the 18th century originally coined the term "Dualism." As a metaphysical theory, dualism states that the world is made up of two elemental categories, which are incommensurable. This includes distinctions between mind and body, good and evil, universal and particular, and phenomena and noumena (Fieser, 2002).

The second theory talked about intelligence as being a property of organic matter. Computer scientists now have the ability to mimic functions of the brain and the body, but as the first theory states, it is impossible to produce intelligence using the physical.

Intelligence philosophy and the third principle using formal systems has created a way in which computer scientist can study human functions or tasks to create tutoring systems, learning environments, simulations,

multimedia systems, and WWW-based systems. The concept

began during World War II where England's Alan Turing used

his mathematical skills to help decipher German codes. The

Germans used a computing machine called the Enigma. This

machine could generate constant changing codes that could

not be deciphered until Turing and his team developed a

device called COLOSSUS that broke the German codes. This

unconscious machine saved Western Civilization from being

conquered by Hitler's Third Reich. It also helped

establish a new science, artificial intelligence (Kowalik,

1999).

Artificial Intelligence in Education

In James Bailey's book After Thought: Computing the

Patterns of Bodies and Minds he says that in 1956, a small

group of investigators came together at Dartmouth College

to reason out and plan ways to get electronic circuits to

reason out and plan their work. The group labeled this

activity "artificial intelligent" (Bailey, 1996). Kowalik,

(1999) discussed Alan Turing, one of the great pioneers in

the computer field. Turing helped pioneer the concept of

the digital computer. He gave details about how a machine

could read ones and zeros from a tape. These ones and

zeros gave details about what the needs would be to solve

a particular problem. Turin believed that by following the blueprints of the brain, he could create an intelligent machine. His research into the relation between machines and nature created the field of artificial intelligence. In one of his noted papers called Intelligent Machinery he is quoted to be among the first to discuss the concept of artificial intelligence. In 1950, he wrote another paper describing what is called the Turing Test. The test consisted of a person asking questions via keyboard to both a person and an intelligent machine. He believed that if the person could not tell the machine apart from the person after a reasonable amount of time, the machine was somewhat intelligent. Computer scientists to this day still refer to his papers (Kowalik, 1999).

Artificial intelligence in education is fundamental to the new paradigm in education. Computer scientists around the world are coming together at conferences to discuss the constant development of new teaching and learning technologies. The International Journal of Artificial Intelligence in Education (IJAIED) is the official journal of the International AIED Society. IJAIED publishes papers and other items concerned with the application of artificial intelligence techniques and concepts to the design of systems to support learning.

Workshop proceedings, conference reports, invited PowerPoint presentations are posted on their web site. It is important to note that one must subscribe to IJAIED in order to have access to their postings (Buiu, 1999).

Buiu (1999) mentioned several world conferences offered by IJAIED in her paper. I will use as an example the 7th World Conference on Artificial Intelligence in Education in Washington DC, USA, 1995. The session topics were enormous. Here is a list of what was offered:

1. Intelligent tutoring systems
2. Learning environments and microworlds
3. Visual and graphical interfaces
4. Human factors and interface design
5. Non-standard and innovative interfaces
6. Intelligent multimedia systems
7. Authoring systems and tutoring shells
8. Collaborative tools
9. Principles/tools for instructional design
10. Natural language interfaces
11. Knowledge representation for instruction
12. Knowledge and skill acquisition
13. Conceptual change/Met cognition
14. Teaching higher-order thinking skills
15. Social and cultural aspects of learning

16. Cognitive development and errors

17. Student modeling

18. Theories of teaching/Motivation

19. Reading and Writing

20. Educational robotics

21. Computer-assisted language learning

22. Evaluation of instruction systems

23. Assessment of learning outcomes

Intelligent tutoring systems interested me the most because it is the fundamental idea behind artificial intelligence. As I mentioned earlier, it is what computer scientist focus on to create tutoring systems, learning environments, simulations, multimedia systems, and WWW-based systems.

When we discuss teaching and learning, we must look at a variety of learning theories to help us to truly understand on what bases computer scientist developed their ideas. There are several theories that are important to remember to this discussion. The following is a list of the learning theories and their definitions:

1. Constructivism is a philosophy of learning founded on the premise that, by reflecting on our experiences, we construct our own understanding of the world in which we live.

2.  <u>Behaviorism</u> is a theory of animal and human
    learning that only focuses on objectively
    observable behaviors and discounts mental
    activities. Behavior theorists define learning
    as nothing more than the acquisition of new
    behavior.

3.  <u>Piaget's Development Theory</u> Piaget's theory is
    based on the idea that the developing child
    builds cognitive structures--in other words,
    mental "maps," schemes, or networked concepts
    for understanding and responding to physical
    experiences within his or her environment.

4.  <u>Neuroscience</u> is the study of the human nervous
    system, the brain, and the biological basis of
    consciousness, perception, memory, and learning.

5.  <u>Brain Based Learning</u> is based on the structure
    and function of the brain. As long as the brain
    is not prohibited from fulfilling its normal
    processes, learning will occur.

6.  <u>Learning Styles</u> is an approach to learning
    emphasizes the fact that individuals perceive
    and process information in very different ways.
    The learning styles theory implies that how much
    individuals learn has more to do with whether

the educational experience is geared toward

their particular style of learning than whether

or not they are "smart."

7.  Multiple Intelligence is a theory of human

    intelligence, developed by psychologist Howard

    Gardner, suggests there are at least seven ways

    that people have of perceiving and understanding

    the world. Gardner labels each of these ways a

    distinct "intelligence"--in other words, a set

    of skills allowing individuals to find and

    resolve genuine problems they face.

8.  Right Brain/Left Brain Thinking is a theory of

    the structure and functions of the mind suggests

    that the two different sides of the brain

    control two different "modes" of thinking. It

    also suggests that each of us prefers one mode

    to the other.

9.  Communities of Practice is an approach views

    learning as an act of membership in a "community

    of practice." The theory seeks to understand

    both the structure of communities and how

    learning occurs in them.

10. Control Theory is a theory of motivation

    proposed by William Glasser contends that

behavior is never caused by a response to an outside stimulus. Instead, the control theory states that behavior is inspired by what a person wants most at any given time: survival, love, power, freedom, or any other basic human need.

11. <u>Observational Learning</u> is also called social learning theory, occurs when an observer's behavior changes after viewing the behavior of a model. An observer's behavior can be affected by the positive or negative consequences--called vicarious reinforcement or vicarious punishment-- of a model's behavior.

12. <u>Vygotsky and Social Cognition</u> is the social cognition-learning model asserts that culture is the prime determinant of individual development. Humans are the only species to have created culture, and every human child develops in the context of a culture. Therefore, a child's learning development is affected in ways large and small by the culture--including the culture of family environment--in which he or she is enmeshed (Funderstanding, 2002).

In Starke-Meyerring and Clemens's article <u>Theoretical and Practical Considerations For Virtual Learning Environments in Technical Communication: an Annotated Bibliography</u> (1999) she discusses an overview of approaches to designing, conceptualizing, developing, and evaluating virtual learning environments. She began her discussion by giving the reader two points of view from the instructor. One she states that some technical communication educators (instructors) felt that virtual learning environments were a quick way to give access to students outside of the base site. Others are considering how these environments can aid in changing present methodologies and pedagogy. The first book that she discussed was <u>In Search of the Virtual Class: Education in an Information Society</u>. She states that the authors desire their readers to look at virtual classrooms as a major part of social change. Then two questions were asked: 1) What kind of system is needed to prepare people for life in an information society? 2) Will extraordinary information technology advance the way we learn, or is it going to be a virtual version of the conventional classroom? This discussion leads us down the road to discuss learning strategies to answer the questions above (Starke-Meyerring & Clemens, 1999).

Curriculum strategies tell how we should learn. Below are some possible answers:

1.  Outcome-Based Education: In outcome-based learning, all school programs and instructional efforts are designed to have produced specific, lasting results in students by the time they leave school.

2.  Core Curriculum: In a core curriculum, a predetermined body of skills, knowledge, and abilities is taught to all students.

3.  Whole Language: This philosophy about curriculum--in both language arts and a broader, more general program--is based on recent research of how children acquire oral and written language skills.

4.  Character Education: This curriculum method revolves around developing "good character" in students by practicing and teaching moral values and decision-making.

5.  Multiculturalism: Since the ability to recognize our own and others' cultural lenses is essential to all learning, it must be taught, along with communication and thinking skills, as prerequisites to learning.

6.  Tech Prep: Tech prep is most traditionally and frequently defined as a four-year program (during grades 11-14) that leads to an associate degree or two-year certificate in a specific career field.

7.  Paideia: This proposes a single, required, 12-year course in general, humanistic learning as a foundation for the future learning of all students.

Instructional strategies tell how strategies should be designed. As:

1.  Mastery Learning: Mastery learning proposes that all children can learn when provided with the appropriate learning conditions in the classroom.

2.  Cooperative Learning: Cooperative learning consists of instructional techniques that

require positive interdependence between learners in order for learning to occur.

3. Accelerated Learning: Accelerated learning aims to create school success for all students by closing the achievement gap between at-risk and mainstream children.

4. Thematic Instruction: Thematic instruction is the organization of a curriculum around macro "themes." Thematic instruction integrates basic disciplines like reading, math, and science with the exploration of a broad subject, such as communities, rain forests, river basins, the use of energy, and so on.

5. Whole Brain Instruction: Whole-brain teaching is an instructional approach derived from neurolinguistic descriptions of the functions of the brain's left and right hemispheres.

6. Service Learning: Service learning combines service to the community with learning outside the classroom. Schools throughout the country are striving to implement service learning along the entire K-12 continuum.

7. Cognitive Coaching: Cognitive coaching is based on the idea that metacognition--or being aware of one's own thinking processes--fosters independence in learning. By providing personal insights into the learner's own thinking processes, cognitive coaching builds flexible, confident problem-solving skills. Plus, it encourages self-efficacy and pride.

8. School To Work Transition: School-to-work programs provide ways for students to transition successfully into the economy, either through paid employment with a business or self-employment. Numerous studies reveal that, upon high school graduation, many students who aren't college-bound are neither prepared for nor connected to employment opportunities.

9. Instructional Technology: Instructional technology is just what it sounds like: using computers, CD-ROMs, interactive media, modems, satellites,

teleconferencing, and other technological means to support learning.

10. Youth Apprenticeship: Youth apprenticeship is a learning system that prepares students for work by giving them a combination of classroom instruction and paid on-the-job training. In this education model, students obtain a set of well-defined occupational abilities by learning concepts in the classroom and applications in a work setting.

Assessment is a way to determine to what extent the learner has learned:

1. Authentic Assessment: Simply testing an isolated skill or a retained fact does not effectively measure a student's capabilities. To accurately evaluate what a person has learned, an assessment method must examine his or her collective abilities. This is what is meant by authentic assessment. Authentic assessment presents students with real-world challenges that require them to apply their relevant skills and knowledge.

2. Class Assessment: Classroom Assessment Techniques consist of a variety of feedback and discussion methods that gauge the quality of the learning process.

3. Portfolio assessment: Provides a body of student work--essentially, a portfolio-- that can be used to appraise student performance over time.

Organizational Theory tells how schools should be designed. As:

1. Total Quality Schools: Total Quality schools apply the principles and practices of Total Quality Management to their administrative and instructional functions.

2. Charter Schools: In concept, a charter school is a self-governing, publicly funded school that the community holds accountable

for the results it produces--such as student learning--rather than for its compliance with school board or government rules and regulations.

3. Accelerated Schools: In 1986, Stanford University introduced the concept of accelerated schools, an approach designed to create success for all students by closing the achievement gap between at-risk and mainstream children. The idea is to radically change individual schools by redesigning and integrating curricular, instructional, and organizational practices so that they provide enrichment--not just remediation--for at-risk students

4. Comer Schools: This is an approach to restructuring the governance and practices of individual schools, initiated by psychologist James Comer in the mid-1970s. This approach hinges on Comer's theory of how children develop and learn, and the reasons that disadvantaged, minority children do not learn in schools (Funderstanding, 2002).

For many educational technologists, "courseware" is the production of computerized learning materials that would fall into one of the following categories.

1. Programmed Instruction (transfer of content proceeds step-by-step)
2. Computer Assisted Instruction (drills and tutorials)
3. Intelligent Computer Assisted Instruction. (ITS tutorials)
4. Computer Based Learning (Simulations, Hypertext and Micro-worlds)
5. Intelligent Learning Environments. (Mirco-worlds+tutors, helpers, experts)
6. Cognitive Learning Support Environments. (Some hypertexts)
7. Knowledge Construction Environments. (Buiu, 1999)

In Dahlen and Kumrow's (2002) Internet report they give an overview of Robert M. Gagne's (1965) Learning Theory. They discussed how Gagne's theory of conditions of learning has several implications for instructional technology. According to Gagne' the design of instruction should involve: analyzing requirements, selecting media and designing the instructional events. Additionally the instructional technologist must keep in mind the following learning concepts when developing methods of instruction.

- Skills should be learned one at a time and each new skill learned should build on previously acquired skills
- The analysis phase must identify and describe the prerequisite lower level skills and knowledge required for an instructional objective
- Lower level objectives must be mastered before higher-level ones
- Objectives must be stipulated in concrete behavioral terms
- Positive reinforcement should be used in a repetitive manner. (Dahlen & Kumrow, 2002)

Central to Gagne's theory on conditions of learning is that instruction must be designed specifically in the context of the learner's needs (Pina, 1993). According to Norton and Wilburg. (1998), Gagne's (1985) model for design of instruction includes a sequence of nine instructional events and its corresponding learning processes that guide the design of instruction.

Table 1. Robert M. Gayne's Events of Instruction

| Instructional Event | Relation to Learning Process |
|---|---|
| 1. Gaining attention | Reception of patterns of neural impulses |
| 2. Informing learner of the objective(s) | Activating a process of executive control |
| 3. Stimulating recall of prerequisite learning | Retrieval of prior learning to working memory |
| 4. Presenting the stimulus material | Emphasizing features for selective perception |
| 5. Providing learning guidance | Semantic encoding; cues for retrieval |
| 6. Eliciting the performance | Activating response organization |
| 7. Providing feedback about performance | Establishing reinforcement |
| 8. Assessing performance | Activating retrieval; making reinforcement possible |
| 9. Enhancing retention and transfer | Providing cues and strategies for retrieval |

Transfer of learning is essential to instructional design. There are several concepts to remember: 1) when designing instruction it is very important to understand the need of the student. An interview with students will give you an opportunity to ask questions and see how effectively the student responds one to one. Providing a variety of supplemental materials, links, video and TV access to programs are just a few ways to stimulate an interest in learning. Audio books are also useful; 2) ensuring consistent interaction with students to determine that learning is taking place is essential. Workshops and

on the job observations is a good place to begin issuing

handouts, pamphlets, a syllabus, cheat sheets, old test,

etc... 3) review is a must! This is a powerful way to

reinforce learning. It also aids in moving information

from short term to long-term memory. Fourth, an evaluation

of students must be performed to determine how effectively

students are learning. This can be done in class on the

job or in any type of setting where learning is taking

place (Gagne, 1985).

A Brief History of Distance Education

Jonassen states that educational technologies have

been traced historically to the advent of movable type in

the 15th century, to illustrations in the 17th-century

books, and the slate chalkboard in the 18th-century.

Educational technologies in the 20th-century include first

lantern slide projectors, later radio and then the motion

picture. Programmed instruction emerged as the first true

educational technology-that is, the first technology to

meet educational needs (Jonassen, 1999).

The ability to offer individualized instruction

without an instructor is one of the great advances of the

times. For many centuries the book has been the model to

allow us to do this. Correspondence courses beginning in

the 1960's via "snail mail" (U.S. Postal Service) were the next big thing in independent study. Today the advent of new technologies has enabled us to provide instruction anywhere in the world.

In 1963 the Instructional Television Fixed Service (ITFS) was created as a result of a Federal Communications Commission (FCC) resolution reserving selected transmission frequencies to be licensed to local credit-granting institutions for educational purposes. The channels can be used solely to deliver instruction. The full allocation of 20 channels is usually available to be used by school systems, colleges and universities in most communities. The first university to apply for ITFS licensing was the California State University (CSU) System (PBS, 2001).

During the sixties, the demand for distance learning was vast. So Congress enacted a bill to support distance learning. In 1967, President Lyndon B. Johnson signs the Public Broadcasting Act authorizing the creation of the Corporation for Public Broadcasting to promote non-commercial use of television and radio. CPB's primary purposes included developing high quality programs, establishing a system of national interconnection to distribute the programs, and strengthening and supporting

44

local public TV and radio stations. In January of 1969,

CPB negotiated with AT&T to interconnect 140 stations,

creating the first true national public television system.

This system became permanent in November 1969 with the

establishment of the Public Broadcasting Service (PBS).

The establishment of National Public Radio (NPR) in 1970

ensured equal interconnection between public radio

stations (PBS, 2001).

Community colleges (2000-2001) have had its largest

student enrollment increase in its history. Students are

returning to school to be retrained in computer Internet

skills to deal with the new high-tech system. Online

courses, distance education, and virtual campuses are

becoming standard in education. A brief history of this

development began in 1971. Distribution and licensing of

Luskin's telecourses was assigned to a new institution,

Coastline Community College. Coastline arranged for

classes to be broadcast by public television station

KOCE-TV to colleges, universities and libraries in Orange

County. Having no physical campus, Coastline becomes the

first "virtual college" in the United States. By 1972,

three community college districts-Miami-Dade Community

College District (FL), Coast Community College District in

Costa Mesa (CA), and Dallas County Community College

District (TX)-would be producing and offering telecourses. Today, the State of California has provided free Internet training through the California Virtual Campus (CVC) to community college faculty. The CVC training is a joint project of El Camino and Santa Monica Colleges and was created under the auspices of the Chancellor's Office for the California Community Colleges (PBS, 2001).

The Revolution in Distance Education

Earlier I discussed how distance education has developed from mailing correspondence courses to the Internet. Parrot (1995) gives a report of US postsecondary distance learning programs predicting that the decade of the 1990's would see such phenomenal growth in distance education programs that most people in the United States would be served by at least one program. She further states that this would take place in Community Colleges. By 1994, she reported that 80% of community colleges in the United States offered some form of distance education program, and it is expected to increase through out the decade (Parrot, 1995).

Kearsley (2001) states that that distance learning has been a relatively exotic form of "alternative education." He goes on to say that all forms of distance

learning depends on technology ranging from mail correspondence to the Internet. He believes that the Internet will engulf all other media's, audio, and video (Kearsley, 2001). Romiszowski (1993) agrees totally with Kearsley stating that individuals or groups can employ the use of a synchronous communication mode using old audio communications to the new computer-based multimedia teleconferencing. He says that the result of this is that virtually all of the activities done in a traditional classroom can be done with distance education in "virtual reality." There are others in the field of education technology like Hiltz, Turnoff, Valee, and Grief that were in total agreement that telecommunications-based communications will be used as easily as face-to-face communication is utilized (Romiszowski, 1993).

Faculty acceptance and participation is the key to making any pedagogical change (Chang, 1998). Technology in the classroom, distance learning, and how to use it has not truly been understood or explained in a proper context to faculty. Most college and university faculty do not receive formal training in the theory and practice of learning and instruction. The majority of them earn their degrees going directly into teaching without being trained to teach using one of the many learning theories I

mentioned earlier like Constructivism. They do not understand that computer scientists through artificial intelligence and intelligent tutoring systems have studied the brain, human functions and tasks to create multimedia, simulations, virtual environments, WWW-based systems, authoring shells, and software specifically for teaching and learning. Learning strategies (Learning styles), curriculum strategies (Whole language), instructional strategies (Thematic learning), assessment (Authentic Assessment), organizational theory (Total Quality Schools), and computerized learning materials (Computer Assisted Instruction) are all essential elements used in teaching and learning environments traditionally or nontraditionally (online). If these ideas are presented to faculty with this understanding, it will be more readily accepted.

Another interesting point brought about is the lack of research being done in the adaptation and technology and the changes in the psychological and physical environments brought about distance learning (Chang, 1998). Faculty resistance has also arisen because instructors do not know where they stand in relation with the technology. Further, many are concerned with intellectual property rights, fair compensation (residuals

for every time the course is shown), copyrights, decline in quality, and preserving human contact (Parrot, 2001).

Schuyler (2001) comes to us with a different idea about the paradigm change with education technology. He reports that true instructors are dedicated and concerned with student achievement, but the systems change from the instruction paradigm (Cognitive) towards a learning paradigm (Constructivist) is inevitable. He says that a new paradigm shift occurs only when the existing paradigm has problems that it cannot solve. So a new paradigm shifts is employed as a means of hope in solving the old model's problem. He states that the outcry of the problem began in the 80's when drugs, gangs, the arms race, and technology permeated throughout society and the world. The Wingspread Group, a private organization whose mission is to bring in invited quest to discuss public interests to come up with some solutions recommended that American workers be educated to levels that maximize their productivity. Wingspread also recognized the fact that under the current paradigm many students are weeded out of math and science lack high-tech skills. So the solution is to resort to a new learning paradigm creating a new way to deliver education where everyone can participate. This learning paradigm is to fundamentally place learning first

in every phase of the educational system overhauling the traditional model (Schuyler, 1997).

The information from this last report by Schuyler reminded me of Dr. Molina's Education course where we discuss Functionalist Theory. Feinberg states and I quote: "Functionalism is a theoretical orientation about how social events and institutions are viewed. Functionalism has also served as a scientific foundation and the justification for many different kinds of educational reform. Further Functionalists believe that schools are the essential transformation mechanism between life in the family and life as an adult in a modern, urban, industrial society" (Feinberg, 1998, p. 15). The Wingspread society is Functionalist. Their recommendation that American workers be educated to levels that maximize their productivity is for the good of society because it takes care of a societal need as stated in the definition. Their recommendation has nothing to do with a person as a whole addressing the needs of the mind, body, and spirit (Schulyer, 1997). Spring (2000) tells us how the American schools moved from an agricultural society to an urban one during the Industrial Revolution. The role of the teacher changed from the saviors of morality to vocational and social welfare work. The entire teaching profession was

transformed and teachers came under control of state
bureaucracies. The complete school system was set up to
train workers for the factories, and make good citizens of
the students to combat crime and drugs. Feinburg (1998)
says that there are three basic processes that relate to
the social function of schools: Assimilation, Political
Socialization and Modernization. Assimilation is a
cultural concept. The process is to change a group or
individual subordinates to conform to a superior group
where it is indistinguishable from one another. Political
socialization is a political concept. The process is to
gain ones allegiance to the nation as a whole. Moderation
is a concept dealing with economic and social ideas. It is
the development of the meritocratic, bureaucratic, and
individualistic form of life that is associated with
modern society and is viewed as a prerequisite for
technological and economic development.

The Wingspread Group mentioned that certain students
were weeded out away from technology. Schools have
employed tracking practices in high school by separating
students in to different categories from college prep,
vocational, to general subjects that do not require math,
science, and technology. Ability grouping groups students
within classes based on the student's ability. The

student's ability is determined by the instructor's assessment, and standardized tests. Using these kind of methods have kept many students from realizing their true potential in our schools and statistics have shown that the higher the social background, the higher the chances a student will be in a higher ability group. There is also a higher chance of being placed in college prep courses (Spring, 2000).

Schyuler (1997) explains that we will have many challenges ahead in terms of trying to sort out all of the parameters involved in dealing with the new learning paradigm change. He says that in order to launch learning colleges the old model inherited from an earlier agriculture and industrial society must be redesigned.

Lunenburg (1998) reported the impact that the Holmes Group has on the revolution in the teaching profession. The Holmes Group is a national organization that consists of 100 research universities dedicated to solving the problems that American schools are experiencing with low quality teacher preparation. The Holmes research universities have great influence on educational policy, and they develop the knowledge base for the field of education. Additionally, they prepare the individuals who attain leadership in education. Their research began

upgrading the teacher education programs within their own structure. Further they challenged the 250 leading universities to upgrade their teaching programs.

Lunenburg (1998) discussed the 1995 Holmes report that gave five challenges to the 250 leading universities to do the following: 1) Redesign the Curriculum; 2) Develop a new Faculty; 3) Recruiting a Culturally Diverse Student Body; 4) Creating Professional Development Schools; 5) Build Networks at Local, State and National Levels. The research on Professional Development and Technology recommends Professional Development Schools within public school districts. However, even with the Professional Development Programs Lunenburg reported that teachers who succeed in integrating technology into their curriculum many of them do so on their own time. It has been reported that teachers spend 36 hours a year learning how to use technology in their teaching. 60% of that time is spent alone. 27% of the time is spent consulting with colleagues, and 13% is spent in in-service (Lunenburg, 1998).

In recognizing the pitfalls of the change, Hope (1997), in her article Teachers, Computer Technology, and the Change Process gives solutions to help make the transition easier for instructors who are new to

technology: 1) identify a purpose for computers in the school; 2) involve the teachers in the decision making process; 3) make the computer technology manageable; 4) provide ongoing staff development; 5) recognize the pitfalls of the change process; 6) don't mandate the use of computers; 7) be involved in the process, which means that all parties from administration, teachers, staff, and students. She feels that the applications of theses suggestions will help to alleviate the many frustrations that instructors have when introduced to technology. Bernstein (1998) describes the same frustration within the business world. Organizations are bragging about their latest technology, and few within their structure know how to use it. This sentiment is being heard in boardrooms, conferences, offices, and around the world. Companies realize the need for information technology, and they are putting their money where their mouth is. The US corporate training market has risen spending to $60 billion dollars in 1997. $20 billion was spent on technical training. The question that companies are trying to resolve is how to create information technology training to consistently deal with technology advancement and change. One of the main solutions to their problem is to hire instructors who can utilize live teaching, videoconference teaching and

online teaching through the Internet. Bernstein (1998)
offers several effective tips for instructor-led online
distance learning programs: 1) Have floor control to allow
the classroom coordination; 2) Use a live, interactive
environment combined with self paced learning; 3) Use
collaborative software for application sharing; 4) Use
standards based multimedia PC's, equipped for live, video
and audio interactions and connected to a robust
multicasting network; 5) Use a web-sync agent, which
allows students and instructors to access pertinent web
sites for instruction. Use industry-standard authoring
tools for multimedia courseware including audio clips,
animation, and simulation exercises; 6) Incorporate online
chat; 7) Use course administration tools for registration,
and resource management. Lastly he describes the future of
distance learning discussing some of its downfalls and how
it will improve in time (Bernstein, 1998).

Online instruction can be offered in many formats
says Cooper (2000). All of this depends on several
different parameters, the administrative support,
technical support by the institution, school support, and
the instructor's technical skills. There are several steps
that an instructor can take to begin incorporating
technology in the classroom. There are free sites like

Blackboard, Nasa.com, building ones personal web sites, online support by book vendors, free Internet tools, paid sites like WebCT and Smarthinking, and other sources. After she reported those tips, she takes us through the process of the various actions that took place during four semesters when she taught online. The points she gave about the initial class meeting, online communication within the course, monitoring student activity, having diverse instructional materials, student testing, and online course evaluations were right on the money. For online courses she suggests that instructors have a meeting on site. It can be very beneficial for all. During the course it is important for the instructor to be available to resolve any problems. Monitoring is a must because the instructor can determine the progress of the student. Having diverse materials like Power Point, lecture notes, links, and other sources is necessary to deal with learning styles. Student testing depends on the type of course being offered. Instructors can use software programs like Data Star, a software-testing program that allows instructors to develop tests where the software will grade the test and send the results to the instructor and the student through e-mail. Otherwise it may be

profitable to have the exams on site. The article gave excellent tips for instructors (Cooper, 2000).

In the research study by Snell and Mekies (1999) they asked whether or not online courses are more or less difficult than traditional courses. They concluded that online courses were more difficult. The rational for their findings was that online courses used numerous modalities verses the traditional course using face-to-face. The study consisted of a class that was given by the same instructor, one online and the other offline. The online course used video and the offline course used lectures. The participants were 473 students, and the chi square score was 40.28. The online students had more failures than the offline. Their findings indicated two things: 1) online courses are more difficult; 2) online courses are a valuable alternative for the 21$^{st}$ century (Snell & Mekies, 1999).

Carnevale details a study about the measurement of the online instruction. The study was completed by World Class Strategies Inc. Thousands of surveys were sent out to colleges and universities across the nation. The survey was intended for faculty members who were creative online developers. The study showed that many students look for some of the same traits in traditional courses as they do

57

in online courses. The main things that they looked for
was a knowledgeable professor, and a sense of community.
The bottom line was that students desired quality
interaction between the student and instructor, a student
centered approach, and an ability to learn on their own
(Carnevale, 2000).

## Web Based Training

Web-based training is new technology that has changed
the way instruction has been done. It has revolutionized
distance learning in education, business industry, and
government. Many have incorporated it into their business
to train and upgrade individuals to learn new ideas from
around the world. Uiterwijk, (1998) declares that distance
education programs are far more than a movement away from
the traditional training. It requires focusing on
assimilation and accommodation processes of the adult
learner, types of technology used, and the cost of it. She
defined Web-based training as being an all-inclusive catch
phrase. It describes web-based lessons through e-mail or
files and materials copied on the Internet, multimedia
online books, and live instructor-led video and audio
exchanges through the Internet. She stated that a

definition based on learning outcomes is more effective
(Uiterwijk, 1998).

There are four concept of web-based training: 1) Goal
based training; 2) Instructional strategies; 3) Role of
the instructor; 4) Role of the student. There are also key
differences between the four concepts of web-based
training. The first begins with the differences between
synchronous and asynchronous kinds of web-based training.
Synchronous programs require that the teacher and student
arrange to meet at the same time online for class.
Asynchronous programs permit the student and teacher to
log on independently at any time 24 hours seven days a
week. Second would be the differences between learning as
a group verses an individual. In-group learning students
work on projects as a team creating presentations, solving
case studies, and developing projects. Students
(individuals) work at their own pace and learning success
by one does not affect the learning by another (Driscoll &
Reid, 1999).

Uiterwijk (1998) discussed the ABC's of building a
web-based training program. The initial thing that must be
done is to find an instructional designer to develop the
course. Companies have gone to colleges and universities
to find instructional designers. Nearly 200 US

universities have graduate programs that train

instructional designers (Pina, 1993). There are also

several professional organizations that provide services

to develop courses. One of the best and largest of these

professional association is the American Society for

Training and Development, or ASTD. The first step in

developing web-based training is to write a proposal. In

education the proposal will go through the curriculum

committee, the Senate, and the Dean for approval. In

business the proposal will go to upper management

indicating everything in the project along with its cost.

The next step will be to create a storyboard. The

storyboard should give details about the concepts outlined

in your course outline. The number of pages will be

determined by the amount of information you choose to

discuss in your course. It could be a little as 50 pages

to hundreds of pages. Eye appeal is important and using

audio, video simulations, virtual tours, graphics,

pictures, and other media should also be considered. Money

and how you set up your system of delivery will determine

what you will use from that which is mentioned from above.

Evaluating your training program is a must. In education

make sure that you have access to target audiences

(students and staff) to test your training. In business

make sure that you create a budget for doing an
evaluation. Training is also important issue in web-based
training. There are many people who do not know how to use
computers and doing something online is totally different
from traditional training. The proposal should also
discuss training and its cost. Lastly a Web-master must be
hired to maintain training and the updating of the course
when necessary (Uiterwijk, 1998).

There is a shortage of Information Technology (IT)
personnel--thus more and more organizations have to train
their personnel in the latest technologies. Further, IT
professionals are using web-based learning technologies to
keep their organizational staffs up to date. Distance
learning is used to describe everything from web-based
training, video conferencing, CD-Rom courses, audio
conferencing, e-mail, chat rooms, and learning
repositories where employees can access information and
training. The concept behind web-based training is the
fact that students can access information any time day or
night. Learning Service Directors are finding that it is
easier and cheaper to use web-based training verses the
traditional way. Time is money and having online access
does not take employees away which save companies money.
Nonetheless there are some drawbacks to using distance

learning. In many instances students and employees neglect to check their e-mail and brows through the Internet. This can be a problem, but overall the saving costs are beneficial to organizations (Boisvert, 2000).

The ability to do more with technology by using cell phones, laptops, wireless Internet, and having to deal with a variety of software and the retraining involved can be draining. With all of this in mind we are reminded how under prepared we are in dealing with the legal, moral, and ethical questions being hashed out in courts, Congress, and private homes. The issues include intellectual property, accessibility, usability, security, and privacy. Many have felt that the use of goods and services on the Internet is public. Kaplan (2002) goes into another area dealing with web-based training, and this is the implementation of legislation for intellectual property for online education.

Copyright violations are the issue. Large companies like Napster and the New York Times made public the term intellectual property in their high profile cases. Napster an online music service sold memberships to users selling music without giving compensation to record companies. The New York Times used freelance writers articles without permission and compensation (Kaplan, 2002).

There are no US copyright laws in Education to protect intellectual property. Thus in 1998 President Bill Clinton signed into act the Digital Millennium Copyright Act. There is also a bill waiting to be approved by Congress called the Distance Learning Enhancement Act on the Copyright Office Website under new and pending legislation. You can also protect yourself by using encryption software such as Clever Content. Clever Content disables printing, copying, saving, and print screening. It also has software that guards against obtaining images (JPEG & GIF) and Adobe Acrobat (PDF) documents. Another option is the use of XrML (extensible rights markup language) which tags images, text, video, and other things with copyright information; restricts access to content; and tracks those who access it. The language was developed by a subsidiary of the Xerox Company called Content Guard (Kaplan, 2002).

Accessibility to computer technology for many around the world is a problem. There are 53 million Americans with disabilities so Congress passed legislation to address this issue under Section 508 of the Rehabilitation Act, which states that all electronic and information technology procured, used, or developed by the federal government after June 25, 2001, must meet accessible

standards. The technologies included are: fax machines, telephones, copiers, electronic devices, websites, and software. For more information about the Rehabilitation Act, go to www.w3c.org (Kaplan, 2002).

Usability is of utmost importance when designing and developing web-based training. Kaplan gives a breakdown as to what features to consider. They include: display speed, color, ease of navigation (site map, informative headers, and so on), content that is well written, and readily available technical help or tips, and contact information for the site owner (Kaplan, 2002).

The Learning Channel presented a documentary called Hackers. The documentary gave a history on hackers beginning with phone hacking to high tech computer hacking. The sophistication, skill levels, and the seriousness of hacking are criminal and could possibly be treason if one were to obtain government intelligence and divulge it to other enemy governments. Kaplan, (2002) states that it is possible to break into a computer or website and control it at will. So if you don't have virus security software, it is important to get it.

Keeping the anti-virus program current through regular updates is a must. Two well-known anti-virus programs are McAffee VirusScan and Norton Anti-Virus.

Firewalls that filter information in and out of your computer are also necessary to install because hackers using Worn and Trojan Horse programs and software set to automatically scan whole ranges of Internet Protocol (IP) addresses. Some of these programs have the ability to log every keystroke you type accessing your e-mail, files, credit card numbers, and other important information. Zone labs (http://zonealarm.com/) is considered one of the best companies to provide this service. Although Hackers do have the ability to penetrate unprotected computers, many times they use special tactics to trick employees into give them passwords and other vital information that allow them to infiltrate computers and computer systems. So this brings us to the idea of electronic privacy (Discover Channel, 2002).

Electronic privacy and who has the right to track where and what you do is a paramount discussion that brings about moral, ethical and legal questions that have not been answered. The issue of privacy is so pronounced that companies have hired chief privacy officers (CPO). The responsibilities from company to company vary. Kaplan gave an example of how, Pedro Jauregui, a CPO for a Mexican company in Monterrey Mexico, developed a means to combat hackers. In his position he developed and

communicated policy, instituted a privacy and security awareness program for employees, assessed vulnerability, audited information security practices, measured employee awareness level, raising it from 65 to 95 percent (Kaplan, 2002). When running e-training programs, privacy, and security may be an issue for learners. Five steps are suggested when running e-learning: 1) Create a privacy policy and place it on your site; 2) Secure personal data using encryption technology when transmitting; 3) Let the learners choose their own passwords; 4) Re: Cookies, use one-time, and destroy them after usage (Kaplan, 2002).

Distance education has many approaches and Web-based Training is one of them. Computer-based Training is transformed by the use of the Internet, World Wide Web, and Intranets. Web-based-Training allows one to introduce live instruction for self-directed, self-paced instruction. The material presented is capable of being assessed, evaluated, adapted, and independent of computer platform. Web-based-Training will transform the process and structure in the traditional linear model to nonlinear environments (Gouldin, 1999).

CHAPTER THREE

METHODOLOGY

Population Served

The students taking this instructional designed
course will generally be freshmen and sophomore students
who have not been taught tutoring and study skill
concepts. Tutors must pass a course with a letter grade of
A or B. This demonstrates that they have understood the
course material, but teaching the concepts from the class
to others requires skill and training. Tutors come from a
variety of backgrounds, ethnicities, ages, heights,
weights, colors, religions, economic and social
diversities, and cultures where English is sometimes a
second language.

This instructionally designed model will target
College of the Desert students serving as tutors. To
develop a working knowledge as to how to use the Online
Tutoring Training Course, the tutor must already have
basic computer skills. The tutor needs to know how to
build a web page, use power point, import, export, copy,
paste, do a search, and create basic files. Tutors who do
not have these skills must be trained in Workshops.

67

To report information, tutors must have good writing skills, build web pages, build power point presentations, use e-mail, use links, browsers, and search engines to find information. To process the knowledge that they have obtained, they must be able to impart the information to their tutees, reflect, and demonstrate the ideas they have learned by creating a web page, power point presentation, and or write a report.

## Screen and Visual Design

Designing and developing screens for web sites is new for me. I have designed bulletin boards, picture boards, and tutor boards for many years, and I have a good understanding about art as it pertains to symmetry, balance, coordination, aesthetics, concepts, and ideas.

There is much to think about when it comes to visual design. One has to think about his audience in terms of culture, ethnicity, background, education levels, maturity levels, current trends, historical meanings, and the concept that you desire to present. How to incorporate pictorials, graphics, verbal symbols, font sizing, textures, colors, and color schemes must also be considered.

In designing my web pages, I decided to make it simple using a photo of College of the Desert's Student Center. The photo has beautiful trees in it with the mountains in the background. The color scheme is blue and black. I used those colors because blue represents the sky and black is the night sky. I placed 5 links above and below the photo so that students would have something pleasant to look at while navigating through each page. Consistency is very important, so I made sure that each web page was the same in format, color scheme, and photo.
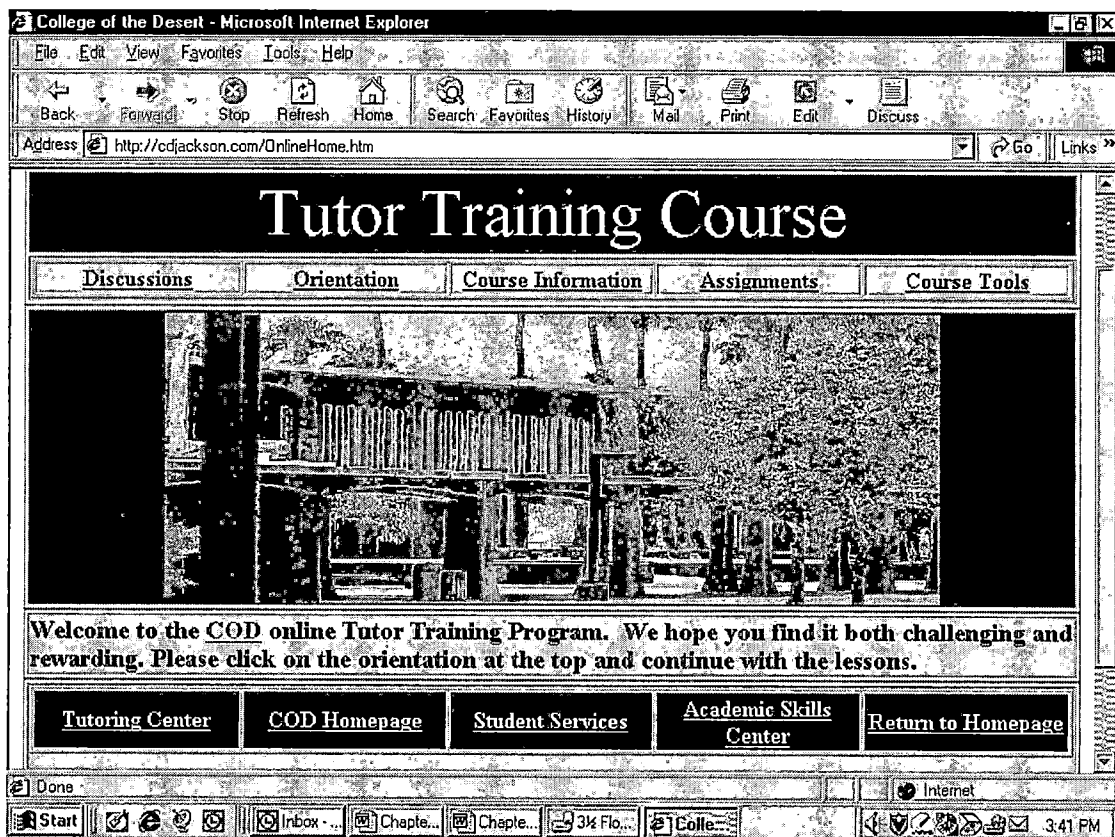


Figure 3. Tutor Training Course

## Procedures

Needs Assessment: I used a questionnaire to determine what the needs would be in order to build an online course. Traditional courses use cognitive and behavioral theories to deliver instruction. The online course is geared toward Constructivist theory. Tutors will be trained using the same tutoring concepts, but the delivery mode will be different. The computer, the Internet, videotapes, and collaborative methods for learning will be incorporated into the course. Thus, I needed to know the skill levels of my tutors in using technology, computers, and the Internet. So I created a questionnaire with 25 questions to help me discover their skills levels.

## Instructional Analysis

The tutor-training course that I created was based on the curriculum that I used in the traditional course. I have a syllabus that has goals, objectives, and information about what they are expected to learn and do after the course.

## Objectives

The objectives of the course are as follows:

A. Integrate the use of computer/Internet resources to support classroom instruction.

B.  To provide opportunities for students to develop skills sessions or small study groups.

C.  To develop tutor skills in computer use and application relevant to tutoring.

D.  To set a standard for the minimum skills and training a tutor needs to be successful.

E.  To enable a tutor to receive recognition and positive reinforcement for successful work.

F.  To teach tutors to apply critical thinking when tutoring with peers.

G.  Increase tutoring proficiency, student learning, and skill acquisition through effective use of information technology.

H.  Create web pages and Power Point presentations.

I.  To develop the tutors understanding of tutees different from themselves: cultural awareness, learning styles, etc...

J.  To train students in applied study skills for the purpose of sharing these learning strategies with others.

K.  To develop the tutors various aspects of interpersonal communication.

L.  Learn to use the online course in order to tutor others through online tutoring.

M.   To teach the philosophy and ethics of the
Tutorial Assistance Program.

N.   To propagate the goal of having students become
independent and successful learners.

Instructional Strategies and Media
Hardware Used

To create the online tutoring course, I used the
following hardware: e-machine 350 at home, Dell Computers
at CSUSB and COD, Hewlett Packard 970 CXI Desk Jet
printer, and the Sony MVC 0700 Digital Camera. When
building large projects, it is important to use a computer
that has 2 or more gigabyte hard drives because space can
become an issue especially if you desire to use sound and
video. Cal State San Bernardino has excellent Hewlett
Packard LaserJet 4000 printers that can easily allow one
to print large projects. The Sony Digital Mavica Camera
that I used to take the photo for the web page was very
easy to use. It requires a 1.44-megabyte floppy disk and
you can snap around 250 digital photos when shooting at
400 X 600. After photographing, you simple upload the
digital pictures into your computer to do a variety of
things with.

## Software Used

I used two different software programs to produce the online course. I used Microsoft FrontPage 2000 and Adobe PhotoDeluxe 4.0. Front Page is an authoring software program that allows one to create a web page and course without having knowledge of HTML. Although one does not need to know HTML, it does help to know it when you need to make minor adjustments. Bonnie Butterfield, CSUSB's outstanding librarian and Professor Anthony Piña gave me assistance in this area.

I purchased my domain name cdjackson.com and paid Blueberry Hill Communications to host my web page and course on the Internet. Blueberry Hill Communications uses Front Page extensions making it easy to set up a web page on the Internet. I used Photo Deluxe to open the file, label the photos, and save them to my desktop to insert one of them to my web page.

## Navigation

The navigation buttons on the web pages in the Online Tutoring Course were designed with simplicity. On the home page entitled Online Tutoring Course there are 10 navigation buttons to choose from. The buttons were placed above and below the photo of the student center. The five

73

buttons at the top of the photo are linked to a discussion
board, orientation, course information (syllabus),
assignments and the course tools. The buttons at the
bottom are linked to COD's Tutoring Center, COD's
homepage, Student Services, Academic Skills Center, and
Return to home page. These buttons are on every page to
make it easier for tutors to navigate from page to page.

In creating navigation buttons, I could have used one
of the following: a paid yearly fee to an Internet site
that allowed one to create icons or use Front page's
feature that allows one to create buttons. Since I built
the online course using tables, I decided that I would use
Front Page's Hyperlink feature that that allows one to
hyperlink anything that has a URL address. It is easy to
do! All you have to do is create a button labeling it,
highlight it, click on the insert button, then click on
the hyperlink button. This will give you a screen that
allows you to place the URL address where you desire it to
go. Once you place the URL address in the box, you click
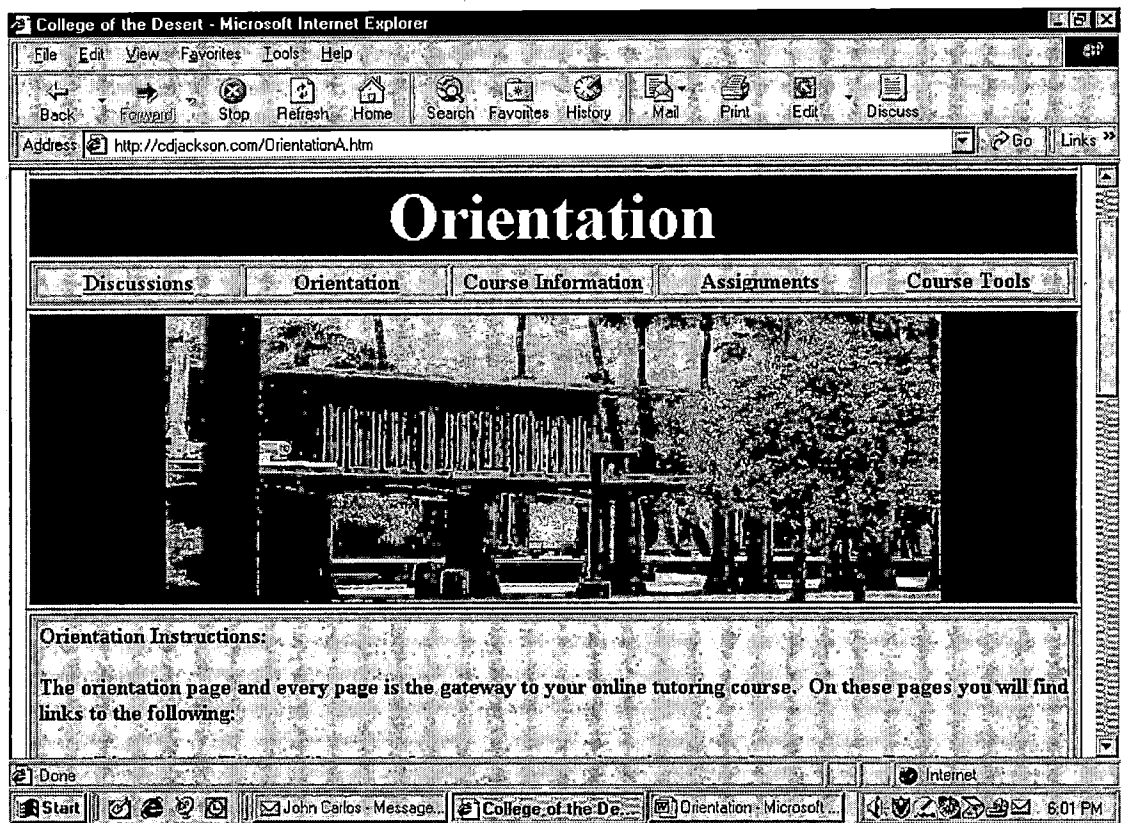on the OK button and your button is hyper linked.

Figure 4. Orientation

## Text

The font that I used for the web pages was Times New Roman. I chose this font type because it is easy to read, and you will find it as a standard in most soft ware programs. The font style that I used was regular and bold. The sizes vary from titles, links, and general information. Additionally, the texts are bold and some of them are underlined to emphasize their importance.

The font colors are black and white while blue was used for e-mail addresses and links to other web pages. I

also used blue and black as a background to enhance the text, and make it pleasing to the eye for easy reading.

## Graphics

As I mentioned earlier, I designed the web pages to be simple. The only graphic that I used was a photo of COD's student center. I took the photo with using Sony's Mavica. After taking the photo, I uploaded it to my computer where I have installed the Photo Deluxe software program. I labeled the photo and inserted it onto my web page template of the online course. I did not have to edit the photo; the only thing that I did was make it smaller by right clicking on the photo. Then I dragged the photo from the corner shrinking it to fit the web page.

The photo was taken from a side view showing beautiful palm trees and the mountains are in the background. It depicts a very soft and pleasant environment to look at while navigating through the course.

## Formative Evaluation

The purpose of the formative evaluation was to improve the online course where needed. So I created a survey that would ask questions about what each tutor would observe when navigating the online course. Tutors

are required to participate in monthly tutor training workshops. Each workshop has a theme. So after completing the online course, I decided to present the online course to them. Each tutor was given an orientation about how to use the course in our computer lab. Afterwards, they were asked to review the course and complete the survey. The survey had 10 questions that inquired about navigation, readability, aesthetics, screen format, and other important areas.

## Using This Program

In order for tutors to use this program effectively, they must know how to use the computer and the Internet to be able to navigate through the online course. Further, tutors must be orientated to use the course accordingly.

In order to use the online tutor-training course, the tutors need to have a computer with at least 16 megabytes of RAM, 56k modem, and an Internet Service Provider.

# CHAPTER FOUR

## RESULTS AND DISCUSSIONS

### Results of the Formative Evaluation

The following table is the result from the survey.

Table 2. Results of Online Survey

| A<br>Strongly<br>Disagree | B<br>Disagree | C<br>Neutral | D<br>Agree | | E<br>Strongly<br>Agree | | |
|---|---|---|---|---|---|---|---|
| Questions: | | | A | B | C | D | E | Total |
| 1. Was the lesson easy to navigate? | | | | | | 1 | 9 | 10 |
| 2. Were the screen formats easy to read and follow? | | | | | | | 10 | 10 |
| 3. Were the instructions easy to follow? | | | | | | 4 | 6 | 10 |
| 4. Did you find the lesson to be simple and informative? | | | | | | 4 | 6 | 10 |
| 5. Do you think that ideas in the lesson will help you to prepare for a tutoring session? | | | | | 1 | 3 | 6 | 10 |
| 6. Do you think the ideas in the lessons are appropriate for tutoring? | | | | | 2 | 2 | 6 | 10 |
| 7. Have you ever used any of the ideas written in the lessons? | | | | | 3 | 2 | 5 | 10 |
| 8. Was the screen format pleasing to the eye? | | | | | 1 | 1 | 8 | 10 |
| 9. Do you think that an online course like this one is a pleasant format for learning? | | | 1 | 1 | 2 | 3 | 3 | 10 |
| 10. Would you recommend that other tutors use this online course? | | | 1 | | 1 | 2 | 6 | 10 |

## Student Feedback

There were 20 tutors who evaluated the program. Out of the 20 participants, 10 were math and science majors, 4 were from foreign language, 3 were from English, 2 from business and 1 from history totaling 20.

One hundred percent of the tutors who completed the survey use the Internet and e-mail. I felt that each one of them had a good sense of what is useful when it comes to using the Internet.

The results of the survey were positive. They strongly agreed that the lessons were easy to navigate, the screen formats were simple to read and follow, the instructions were clear, the screen and format was pleasing to the eye, and they found that the material was useful. These positive results are important to COD's tutoring program. It begins a new era where online tutor training will become the norm. It allows the program to expand by offering tutoring online. It will relieve the tutoring coordinator from having to teach the traditional way. Another online course strength is that it can be taken at the student's convenience, 24 hours a day, 7 days a week, 365 days a year. The students can work collaboratively on assignments and project lessons. The students can use digital cameras, camcorders, and software

programs to complete projects. They can also submit their work electronically eliminating the use of paper. They can communicate with other tutors through discussions and they can critique each other's work.

## Discussions/Conclusions

The online tutor-training course has been created. Tutors, colleagues, and administrators, have seen the results of the formative evaluation. I have met with the Technology Committee, curriculum committee, and the Dean of Student Support Services Dr. Diane Ramirez. After I complete the project and thesis, I will use the online tutor-training course as a pilot. After piloting it, it will go to the curriculum committee to be approved as a regular online course.

College of the Desert has created several online courses and desires to provide tutoring online for traditional and nontraditional courses. This online tutoring course will be the training ground to get tutors ready to go online. So the project has been useful in getting tutoring online.

In my research, I discovered a wealth of knowledge. There were things that I learned about tutoring that I never imagined, and I am sure that other tutoring program

coordinators, administrators, professors, and tutors, would be enlightened by the information divulged in this master's thesis. I plan to give workshops about some of the things that I learned to my colleagues. I have already begun teaching my tutors about some of the things that I learned.

The next phase of my project will be to add sound and video to the course to make it completely independent of the college's facilities. I will also incorporate the use of more technology, software, and hardware to the course. I want the learner to be able to work collaboratively, using digital video cameras, digital cameras, scanners, and any other kinds of technology available for learning.

There is no end to learning, and most importantly, I hope that tutors and tutees will grow to understand that learning should be viewed as life long learning. I am truly grateful that I had the opportunity to produce a project and thesis to increase my skills in educational technology.

The Online Tutoring Training Course is on line at http://www.cdjackson.com/OnlineHome.htm. It is also available on a Zip disk. Straight Ahead!

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