

CHAPTER II

REVIEW OF THE LITERATURE

The purpose of this study is to describe which aspects of course design and/or instruction are more effective and successful in the online environment than in the face-to-face (F2F) classroom and why and how they impact both students and instructors. The literature review focuses on these areas of inquiry: (a) the history of distance education in the United States, (b) distance education theories, (c) background of research in distance education including the collections and meta-analyses of media comparison studies (MCS) and the need to move beyond these studies, (d) assessing and evaluating quality in design and instruction, both face-to-face (F2F) and online, (e) the changing roles of the student and teacher in the online environment, and (f) various aspects of instruction and design in successful online courses.

The history of distance education is discussed to show how the definition of distance education has changed over the past one and a half centuries (M. G. Moore, 2003), to provide background on different media types used to delivery courses at a distance (M. G. Moore & Kearsley, 2005), and to expose the issues that have remained constant regardless of the type of media used or the method of delivery (Sener, 2004). The history also places online education into a slightly

different position than proceeding media types and explains why the Internet is impacting education in significantly different ways (Harasim, 2000).

The progression of distance education theories is included to show how the focus of research has predominately been on the physical science view of distance, but brings into focus the social science theory of distance education that examines not the physical distance between learner and instructor, but the social and contextual variables that exist in a learning environment.

A review of media comparison studies (MCS) covers the background of MCS and the No Significant Difference (NSD) syndrome these media studies created and continue to perpetuate (Russell, 1999). Recent meta-analyses that point to varying outcomes including some that found results of higher student achievement and outcomes than F2F are discussed (Bernard et al., 2004; Hiltz, Zhang, & Turoff, 2001). An examination of the research on student and instructor roles is included to show how student satisfaction and success depend on both the student and instructor being able to adjust to the differences in the online learning environment. The research also suggests that teacher satisfaction is in part dependent upon student satisfaction and success. Thus, student satisfaction in online courses is also included

In order to determine what is more effective and successful online, some sort of criteria must be established and the advantages and disadvantages of both environments must be examined. Quality in course design and instruction is

examined and defined through three evaluation tools (Chico State University, 2005; Quality Matters, 2005a; Sloan-C Consortium, 2005a; WebCT, 2005).

History of Online Education

Web-mediated or online instruction is the fastest growing sector of distance education (U. S. Congressional Web-based Education Commission, 2000). The NCES reports that, "In the 12-month 2000–2001 academic year, there were an estimated 3,077,000 enrollments in all distance education courses offered by 2-year and 4-year institutions. There were an estimated 2,876,000 enrollments in college-level, credit-granting distance education courses, with 82 percent of these at the undergraduate level" (Waits & Lewis, 2003, p. 1).

Additionally, Simonson et al. (2003) state that in 2002 "1,680 institutions offered over 54,000 online courses" (p. 8). One research report indicates those who expect to teach online up through 2011 predict that online courses will account for up to 73% of their teaching load (C. J. Bonk, 2001). The College Technology Review reports that in the 2004-2005 academic years,

Two out of three institutions are offering distance learning programs. The percentage of institutions offering accredited degrees in at least one subject through distance learning programs is now 63%, with the most popular disciplines being business and the social sciences. (MDR, 2005, para. 3)

Almost all higher educational institutions in the United States offer some form of distance education today (Saba, 2005). "If current trends continue, it will be just a matter of time before distance education becomes the dominant form of teaching and learning" (p. 257).

In ten years, online delivery has progressed from static HTML pages coupled with email and listserv technologies to integrated course management systems. The proliferation of the Web and its ability to connect a diverse population from around the globe has prompted higher education to seek ways to use this technology; from online admissions, registration, payments, and recordkeeping to email communication, department, instructor and student web pages, and online course delivery and instruction. The Internet was born in academic research, so it would seem logical that it would be used for teaching and learning (Howe, 2004).

The Web and the Internet is the current defining technology in the distance education arena, but it is not the only one that has shaped and developed distance education (M. G. Moore, 2003). An examination of the history of distance education reveals that, although the assertion is made that “educational decisions are not technology driven” (p. 8), emerging technologies have changed educational organizations and teaching practices as a result of using that technology.

A primary emphasis of the distance education effort is, and has been, to make opportunities for continuing education available to those who otherwise would not be able to pursue or further their education because they could not attend on-campus classes (Spooner, Jordan, Algozzine, & Spooner, 1999; Verduin & Clark, 1991). This effort took the form of courses and programs offered outside of traditional institutions, delivered in alternate formats, and many times

resulted in the student and instructor being separated by physical distance and time (Verduin & Clark, 1991). This format of delivery also required that the learner be more independent and aggressive in their studies.

Independent, Correspondence, and Extension Learning

In the United States, the first distance education undertaking was the Lyceum movement. Josiah Holbrook began the movement in Connecticut in 1836 based on his desire to spread knowledge to young and old, male and female, believing that education should continue all through life, regardless of age and gender (Eklund, 1976; Stambler, 1981; Weaver, 1976). Following the Lyceum Movement was the Chautauqua program, originally designed to train Sunday school teachers with a combination of religious and secular curriculum. Soon, because of its success, the expanded curriculum included art, music and physical education. The Institute also produced the oldest continuous running book club, the Chautauqua Literary and Scientific Circle (CLSC). The circle introduced the idea of correspondence as a way of learning (Chautauqua Institution, 2002). Participants attended the summer courses at the Institute and then completed their studies through correspondence during the winter months. Yale University professor, William Rainey Harper, served as the director of the Chautauqua College of Liberal Arts from 1883 to 1891 (Moore, 2003). During his tenure, the state of New York formally authorized the College to “grant academic degrees to students who successfully completed work at the summer institutes and by correspondence during the year” (Watkins, 1991, p 4).

Harper stated that although correspondence study would not replace traditional instruction, “there is a field for each which the other cannot fill” (Watkins, 1991, p4). He felt that correspondence students would know more of the subject and know it better than the student in the classroom. He predicted that the number of students who would study through correspondence would soon outnumber those on campus. Moore (2003) states that in 1926 there were four times as many students enrolled in correspondence schools as there were students “enrolled in all of the colleges, universities, and professional schools in the United States” (p. 11).

The Chautauqua opened the way for University Extension. It drew support of many prominent university faculty, but it lacked the resources needed to keep it going and declined in popularity. University Extension was taken up by various institutions that could provide the resources needed to provide adult education opportunities (Watkins, 1991). The armed forces, in particular, used extension courses to fill a need within their organizations. The United States Armed Forces Institute (USAFI), provided high school and college courses to military personnel during and after World War II (M. G. Moore, 2003; Watkins, 1991). The USAFI “pioneered the computerized distribution and marking of assignments, a 24-hour phone-in counseling service for students, and the use of group study classes linked to the correspondence curriculum” (Moore, p. 12). Currently the Armed Forces use eArmyU.com to bring colleges and university together to offer a

broad range of education opportunities to enlisted men and women throughout the world (Saba, 2005, p. 261).

Another type of distance education in the United States involved courses delivered by mail. Typically known as correspondence study, private, for-profit schools called it home study; whereas universities called it independent study (M. G. Moore & Kearsley, 1996). The first home study program was operated by Anna Ticknor out of her home in Boston, Massachusetts. In 1879 she established the Society to Encourage Studies at Home. For 24 years, she and a team of volunteers provided opportunities to women across all classes for education (Watkins, 1991).

In 1890, Colliery Engineer School of Mines, founded by Thomas Foster, provided home study to mine, railroad and iron workers. The first course offered was mine safety and it proved to be very successful. Colliery then became the International Correspondence School (ICS) and by 1923 had an enrollment of over 2.5 million students in courses (M. G. Moore & Kearsley, 1996). Today, ICS is Education Direct, a subsidiary of Thompson Learning (Thompson Education Direct, 2005).

In 1926 the National Home Study Council was formed to improve the standards of correspondence schools. The reputation of correspondence study had become sullied by the actions of a few disreputable for-profit correspondence schools. The council created a body of rules that were used to prosecute unethical for-profit home study providers. This *cloud* cast over home

study is still overshadowing the reputation of the field. As a result, educators and administrators in both K-12 and Higher Education discount home study as a valid form of education. The council was renamed the Distance Education and Training Council in 1994. It serves as an accrediting body approved by the U.S. Department of Education (M. G. Moore, 2003).

The first institution to offer independent study courses was Illinois Wesleyan University by offering courses to be taken “in absentia by non-resident students” (Watkins, 1991, p. 4). There was an urgent and legitimate need to provide bachelors, masters, and doctoral degrees to adults across the United States who wanted to pursue a degree but could not attend classes on a campus because of work or financial challenges. The program enrolled up to 1900 students between the years of 1881 and 1900. In spite of the apparent need it was filling, the Executive Board of Wesleyan and educators across the nation felt that the program was not of a “sufficiently high standard of excellence” (p. 5). This group recommended termination of the program by 1906.

The program at Illinois Wesleyan was not the only one to suffer for lack of support of administration and faculty. In 1885, the state legislature of Wisconsin funded short courses called Farmers’ Institutes. The regents of the University of Wisconsin established the short course to facilitate these institutes, but the president and faculty did not offer their support at first. It was not until 1887, when the new president, Thomas Chamberlain, championed the cause along with faculty member Frederick Jackson Turner, a historian. They both saw merit

in these institutes (Watkins, 1991). The success of these institutes paved the way for university extension so that by 1891 they were supporting a series of mechanics' institutes as well. By this time, campus faculty members were teaching the courses. They were compensated for their teaching, but it could not allow these teaching endeavors to interfere with their campus duties. Faculty enthusiasm waned as they dealt with extended, sometimes difficult travel and long hours on top of their regular duties on campus. Jerome Raymond, appointed as secretary in 1894 to oversee the program, was not able to keep faculty enthused about their involvement and by 1899 the institutes were discontinued (Watkins, 1991).

The University of Wisconsin extension program experienced a revival under the presidency of Charles Van Hise. During his time in office, 1903 to 1918, he reactivated the program in response to a report that suggested that commercial correspondence schools were enrolling over 35,000 Wisconsin residents a year, bringing in \$800,000 in tuition. Obviously, he wanted that tuition to come to the university rather than going to the commercial schools. The program was touted in the University Bulletin as providing "individual contact with instructors, positive use of one's spare time, convenience of working at home and promotion of the virtues of self-reliance and self-determination" (Watkins, 1991, pp 14 - 15). These are same characteristics of distance education are used today for promotion of online courses and programs.

The University of Chicago is another institution that pioneered correspondence study. Under the guidance of the former director of the Chautauqua Institute, William Rainey Harper, the University of Chicago was formed in the 1890's. In 1892, he invited Richard Moulton from the United Kingdom to help him set up the extension division of the University to deliver courses by mail. (M. G. Moore & Kearsley, 1996). University faculty taught the courses to keep university tradition, but they tired of the travel and the "marginal position of extension instruction" (Moore & Kearsley, 1996, p 7). The emphasis of this program was on research, experimentation, and resident teaching; whereas the emphasis of the University of Wisconsin program was more vocational and professional.

Educational Technology

In the 20th century, technological advances triggered the interest of educators as a way to provide instruction, either on-campus or off. During 1922 and 1923, the FCC granted educational radio licenses to the University of Salt Lake City, the University of Wisconsin, the University of Minnesota, and the Pennsylvania State College to broadcast courses over the radio. Between 1918 and 1948, 202 licenses were granted. In 1927, the State University of Iowa stated that the use of radio would entirely change the institution (M. G. Moore & Kearsley, 1996). But this dream was not realized as radio did not attract the interest of faculty and administration. Lack of interest on the faculty's part, poor quality of the instruction, and fierce competition from the commercial

broadcasters who wanted radio for advertising accounted for the lack of success of educational radio (M. G. Moore & Kearsley, 1996).

The earliest use of television for educational programs was in 1934 at the State University of Iowa. By 1939, the university had broadcast almost 400 educational programs. The success of educational television can be traced back to 1950 when the Ford Foundation granted funds for educational television station construction. In 1961, the Midwest Program of Airborne Television Instruction took off. DC-6 airplanes carrying transmitters that broadcast educational programs flew over a six state Midwestern region. This program lasted six years and helped pave the way for future satellite broadcasts of educational programs (King, 1997; M. G. Moore & Kearsley, 1996). In 1972, the FCC required cable companies to provide an educational channel as part of their system. The first attempt to make an interactive video course was in 1977 in Columbus, Ohio. A special keyboard was used to allow students to respond to tests (M. G. Moore & Kearsley, 1996).

Audio conferencing was, and still is, used to conduct class via telephone. Special equipment is needed to tie in or *bridge* the calls coming into one center so that everyone can hear everyone else. There might be a person or person(s) gathered together in a physical place with a device, called a convener, which has a speaker so that those on the phone can hear everyone, including those in the room, and visa versa. The Articulate Instruction Media (AIM) project at the

University of Wisconsin is one of the most famous audio conferencing systems (M. G. Moore, 1999; M. G. Moore & Kearsley, 1996).

Satellite distribution schemes were being experimented with in the 1970's. Universities in the United States were using the Applications Technology Satellite to transmit programs to receiving stations that would then distribute them by Instructional Television Fixed Service (ITFS). ITFS was a low-cost distribution system with a transmitting distance of about 20 miles. By 1990, Direct Broadcast Satellite allowed programs to be transmitted directly to locations via a small, low-cost satellite dish. Satellite technology was responsible for the burst of interest in distance education in the United States because it expanded the physical distance to which instruction could be sent and received. Institutions from across the country formed consortia, voluntary associations of independent institutions that shared the costs, the work and the results of designing, delivering and teaching educational courses via satellite (M. G. Moore, 2003).

In 1975, nine Midwestern universities formed one of the first consortiums to provide courses using video. The National University Teleconferencing Network (NUTN) was formed in 1982 with 40 NUCEA institutions working together to plan and deliver educational programs by satellite. National Technological University (NTU), based in Fort Collins, Colorado, began in 1985. Although it awards its own degrees, courses are offered by institutions all over the country, uploading them to the NTU satellite and then distributing to the institution where the students are. NTU filled a niche in keeping engineers up to

date in their field while not having to travel and/or take time away from work. As incentive for engineering faculty to participate, they get paid per enrolled student. It is interesting to note that NTU and NUTN are market-driven models. The market dictates what courses are needed by the students. The collaborations seem to be a cost-effective way of meeting the market need by having a large pool of universities that can offer a broad selection of courses. It is claimed that quality of the courses gets better because these institutions and instructors are competing for enrollments (Moore & Kearsley, 1996). But there were still many barriers reported in the use of television for distance education offerings. High production and delivery costs, faculty resistance to television instruction, and lack of institutional support were among the barriers reported (M. G. Moore, 2003).

The next step for technology-mediated instruction was video-conferencing. When it was first developed it was a one-way distribution technology. The instructor and some of the students would be in one location with the other students in a separate location. The students at the second location could hear and see the activities in the first location, but they could not participate. As the technology improved it became a two-way distribution method in which the participants in the first location can also hear and see those in the second location and visa versa (Mizell, 1995). All participants are able to interact in real time. Broadband technologies will make it possible to deliver two-way real-time video to individual desktop computers.

The Internet

Technology has had a huge and far-reaching effect on education. But no other technology has had such an impact as the invention of the personal computer, the Internet and its subsidiary, the World Wide Web (the Web). Many think that online education is a very new phenomena that began with the creation of the Web in 1992, but it has a long history that stretches over nearly three decades (Harasim, 2000).

Intel invented the first microprocessor in 1971 and the first PC, the Altair 8800, came on the market in 1975. In 1991, Tim Berners-Lee invented the Web, a network of computers located all over the world, capable of transmitting data across telephone lines. The Web received its first graphical browser named Mosaic, the first Netscape browser, through the work of Marc Andreessen in 1993. Originally used for research and information sharing between government, military and educational institutions (Simonson, Smaldino, Albright, & Zvacek, 2003), the Web was opened for business use by corporations in the spring of 1995 when the NSF dropped funding of the backbone and Internet traffic had to rely on commercial providers such as AOL, Prodigy, and CompuServe (Zakon, 2005). The graphical browsers made searching, accessing, reading and exchanging information much easier for those who were not technically sophisticated. These browsers put the Web into the hands of the average person.

The corporate sector jumped on the chance to expand their advertising and marketing reach. First, using static web sites and then the development of the programming and protocols that enabled e-commerce transactions, business accounted for a large portion of the growth in the number of hosts (servers) from 1 in December of 1990 to 46,067,743 at the beginning of 2004 (Zakon, 2005).

The Web enabled students to access information in text form and later, with the improvements in the user interface and transmittal technology, audio, video, graphics, and to obtain information from worldwide databases. It has also provided opportunities for communication with others around the world. This interaction can be carried on synchronously via computer conferences or chat technologies, or asynchronously using email, list-servs, and discussion boards. There are also videoconferencing capabilities being improved for use over the Web (Moore & Kearsley, 1996). These technologies have opened the way for correspondence to be carried on in real-time, or not, with one person, or many. This is something that no other technology has been able to do and thus, computers and the Internet are being touted as the technology that will change the face of education (Simonson, et al., 2003).

Clearly the Internet is here to stay. It has had a tremendous impact on the way we live our lives and conduct our everyday business. This same impact is being felt in education also, although at a much slower pace than found in business. The first online course in adult education was conducted in 1981, the

first online program in executive education in 1982. Computer-mediated and email communication began as early as 1971.

Online Education

The challenge now is to determine the best methods for using these technologies to create a new breed of teaching and learning with high-quality, interactive online courses. It is interesting that we are hearing the same rhetoric around online distance education that we have heard in the past. Distance education provides opportunities for those who otherwise would not be able to pursue education because of professional and work responsibilities (Benke et al., 2004; C. J. Bonk, Cummings, Jack A., 1998; Dziuban, Hartman, & Moskal, 2004; Hiltz, Zhang, & Turoff, 2001). Distance education can provide continuing educational opportunities to those who, because of professional necessity or desire, are life-long learners (Simonson et al., 2003). Distance education can respond to the market by delivering just-in-time education to those who need it, when they need it (C. Gunawardena & Zittle, 1998; Harasim, 2000; Moskel & Dziuban, 2001; Saba, 2005). Distance education provides flexible learning so that learners have access to education 24 hours a day, 7 days a week to help use their spare time to pursue the degree they have always desired but cannot obtain through traditional means (Harasim, 2000).

It would be a waste of educational potential for educators to back away from this technology out of fear or lack of answers to their questions. Harasim (2000) made a keen observation stating “Humans have experienced several

paradigmatic shifts, but they have never intentionally shaped them. Today, we have the unique opportunity and responsibility to engage in designing, at least to some degree, the world that we, and future generations, will inhabit” (p. 52). As we are still facing the issue of how to assess quality in these courses and increase interaction, it will be important to figure out how to use it in an entirely different way than traditional on-campus instruction has been used. There is tremendous potential in online education, and this will need to be discovered through research and experimentation, with support from faculty and administrators (IHEP, 2000).

Distance Education Theory

Distance education theory attempts to explain the phenomenon of education conducted at a distance and why this is essentially different from other forms of education. Some theories put the learner in the center of the design, delivery, and instruction. “Börge Holmberg, Charles A. Wedemeyer, and Michael G. Moore put the learner and his or her interaction with others at the center of the education process, and understanding this fact is essential for discerning why it is essentially different from other forms of education” (Saba, 2003, p. 4).

Holmberg stated that learning is an individual activity and is accomplished not only as an internal process, but also in relation to the teacher’s role. There is a relationship between the learner and the instructor that he called guided didactic conversation (M. G. Moore & Kearsley, 1996; Saba, 2005). Independent learning in an anytime, anywhere learning environment was promoted by Charles A.

Wedemeyer (1981), who helped form the first open university in the United Kingdom (M. G. Moore, 1999; M. G. Moore & Kearsley, 1996). His theory is based on the premise that learning is an independent function of the learner facilitated through a variety of means and strategies, and focuses on independence, control and responsibility of the learner. Michael G. Moore (1996, 2005) defined the relationship between the student and teacher as educational and psychological distance; specifically the interaction between the student's autonomy and control and the control and structure that an instructor or institution put on the learning environment (Saba, 2003). Holmberg (1995) promoted the idea of placing the learner at the center of the educational process. "A basic general assumption is that real learning is primarily an individual activity and is attained only through an internalizing process" (p. 47). While emphasizing the autonomy and independence of the learner, he did not discount the learner-teacher relationship, using the term "guided didactic conversation" (p. 47) to describe the interaction between the learner and the teacher.

Others have focused their theory more on the organizational or structural issues of distance education. Otto Peters was the first to conceptualize the industrialization of education or using technology to reach a mass audience of students (M. G. Moore & Kearsley, 1996; Saba, 2005). Peters promoted the idea of the division of labor in course production, an idea that Wedemeyer put into practice in the AIM project at the University of Wisconsin (Saba, 2003). The British Open University was one of the first institution to be based on the course

design team model for the design of instructional materials for mass production (Saba, 2003). Keegan (1993) classified institutions into two general categories; free-standing, autonomous institutions such as correspondence schools and distance teaching universities, and those institutions that have independent study divisions, consultation systems, and integrated systems that provide the same curriculum to both on-campus and distance students.

With the advent of the Internet and online or web-based distance education, many argued against the industrialization mode. Garrison and Anderson (2003) stated that research universities in particular, needed to be careful not to succumb to the industrialization of distance education and mass production of instructional materials. Harasim (2000) defines five attributes that distinguish communication in the online environment: group communication (many-to-many), place independence (anywhere), time independence (anytime, asynchronous), text-based but enhanced by multi-media, and computer-mediated messaging. Moore also delineates between three different types of interaction in distance education; learner-instructor, learner-content, and learner-learner interaction (M. G. Moore & Kearsley, 1996).

Distance education was primarily founded within the realm of adult education, so the principles of adult education by Malcolm Knowles are closely tied in with distance education theory (Knowles, 1990). Theories of adult education and adult learners, differentiated from children, were originally developed in the 1960s in Europe. Malcolm Knowles brought the theory of

andragogy to the United States in 1968. Defined by Knowles as “the art and science of teaching adults” (Baumgartner, Lee, Birden, & Flowers, 2003, p. 12). He presented five assumptions of adult learners; they are independent and self-directed; they use their experiences as resource for their learning; their learning is connected to their work and social lives; their learning is oriented more towards performance than subject; and their motivation is more internal than external (Baumgartner et al., 2003; Cyr, 1999). Cyr (1999) assimilated the research on adult learning theory from the 1970s – 1990s to arrive at these findings: Adult learners are generally more self-directed; they use their past learning experiences as a resource for learning; are more oriented to problem-centered learning; and their motivation is more internal than external. She listed the characteristics of adult learners as: self-directed and goal-oriented, learning is related to their goals, they learn as a result of their needs, and instruction needs to be relevant to their learning goals and needs. Adult learners are driven by a life-long desire to learn and a single topic has more appeal than a survey of topics. Suggested activities for adult learners are simulation, problem solving, and real-world or real-life case studies. Knowles (1990) later recognized that these characteristics are not solely the domain of adult learners, but that all learners, regardless of age, are somewhere on a continuum between external and internal direction, motivation; dependence and independence.

Definitions

Feasley (1983) defines distance education as instruction that uses individualized learning materials or electronic media (see also Keegan, 2002; Verduin & Clark, 1991). Keegan (2002) uses five criteria for defining distance education:

1. Quasi-permanent separation of teacher and learning (distinguishes it from F2F)
2. Influence of educational organization in the planning and preparation of the materials and provision of student services (distinguishes it from private student and teach-yourself programs)
3. Uses technical media - print, audio, video, or computer, Web or Internet - to convey course content and communication between teacher and student
4. Provision of two-way communication for student benefit, student may initiate dialogue
5. Quasi permanent absence of the learning group through-out the course so that the learning is mostly done independently with the possibility of some group learning activities online or F2F.

Sankaran and Bui (2001) state, "Distance education is the process of instruction and learning via virtual classrooms where teachers and students are separated in space and sometimes in time" (p. 191). Simonson et al. (2003) define distance education as "institution-based, formal education where the learning group is

separated, and where interactive telecommunications systems are used to connect learners, resources, and instructors” (p. 7). For the purposes of this study, web-based and/or online education will be examined.

A definition offered by Moore & Kearsley (1996) and Saba & Shearer (Saba, 2005, 1994) focuses more on a social science description than the physical description of distance education. Saba & Shearer (2005) state that “distance in education is a social and psychological phenomenon” (p. 262). Moore (1996) examined articles and found that two variables explain the phenomenon the best:

- Structure - “the required control that an instructor and or an instructional institution brings to an education system” (Saba, 2005, p. 262); and
- Autonomy – “the requisite control that the learner exerts in defining the his/her objectives, selecting learning strategies, identifying learning materials, etc.” (Saba, 2005, p. 262).

The function of these two variables is what Moore & Kearsley (1996) call transactional distance.

If distance is defined as above, the impact on the design and practice of distance education can no longer just examine and consider the technology used or the physical distance of the students to the instructor. Learning environments must be examined for their flexibility to balance the structure and autonomy of the institutions and the learners. “A significant implication of demonstrating the

concept of transactional distance in a system dynamics model is that education systems of the future must respond to learner differences dynamically as the learning process evolved and not necessarily be based on pre-determined programs” (Saba, 2005, p. 264). Current Learning or Content Management Systems (LMS or CMS) such as BlackBoard® or WebCT®, are not built to inherently accommodate individual learner differences, much less different learner states that allow for individualized instruction as they progress through a course of study without this being intentionally designed into the course by the instructor.

Evaluating Online Courses

As Good As F2F

The question of whether any technology or media can produce courses that are as good as F2F courses has been a primary issue spanning over 160 years of educational history (Conger, 2005). This issue appeared as each new technology or media came into existence and was used to provide educational programming beyond the traditional brick and mortar institutions.

Correspondence study, independent study, extension courses, radio-broadcast, televised, one-way and two-way video, satellite delivery have always been viewed as inferior to the traditional F2F, classroom model (M. G. Moore, 2003; Watkins, 1991).

Computer-mediated and Web-based education has been, and continues, to be scrutinized because it still labors “with lingering perceptions that it is

somehow inferior, unproven, and limited in application relative to traditional classroom instruction" (Sener, 2004, para. 1). Online and web-based courses and programs have had to undergo closer scrutiny and more extensive review, including comprehensive documentation and financial plans, than any F2F program or course. This produced the No Significant Difference (NSD) phenomenon (Russell, 1999) whereby computer-mediated and online courses were examined and compared with F2F courses to establish equivalent measures of quality (Curran, 1997; Glass, 2003b; Hiltz, Zhang, & Turoff, 2001; Sener, 2004)

No Significant Difference

A much publicized report by Thomas L. Russell at North Carolina State University in 1999 called the No Significant Difference (NSD) phenomena examined 355 research studies over 30 years to see if using technology impacted student learning (Russell, 1999). Russell, as quoted by Clark (1994) , concludes "There is nothing inherent in the technology that elicits improvements in learning, although the process of redesigning a course to adapt the content to the technology" (p. xiii) can improve the course and improve the outcomes. In other words, learning is not caused by the technology, but by the instructional method embedded in the media. "No matter how it is produced, how it is delivered, whether or not it is interactive, low-tech or high-tech, students learn equally well" (Russell, 1999, p. 22). Clark (1994) maintains that the delivery medium does not affect learning. But Russell also states that although we are not

finding evidence of any gains using technology, we are also finding no losses. "...the studies provide substantial evidence that technology does not denigrate instruction" (p. 7). Two interpretations of the Russell's NSD compendium have followed:

1. Using technology does not harm, so students in a F2F classroom have no advantages over those in a technology-mediated classroom
2. On the opposite side, if it does not help, why use it when it takes more time to develop and uses more resources?

The Institute for Higher Education Policy (IHEP, 2000) report, What's the Difference? Phipps and Merisotis (1999) cited some short-comings in the research on the effectiveness of distance education conducted during the 1990's. Among the shortcomings mentioned were: student outcomes for individual courses were examined instead of entire programs, not accounting for the differences among students; lack of explanation of distance learners high drop-out rate; did not connect students' learning styles with the use of particular technologies; examined only one technology; not the interaction of multiple technologies; no theoretical or conceptual frameworks were used; and did not examine the effectiveness of electronic resources such as digital libraries used in programs.

Questions that need to be asked include: What is the 'quality' of the access? Does the student have the necessary skills to use the technology? What are the best ways to participate in asynchronous

communication? Is there adequate technical support? Perhaps most important, will the cost of purchasing a computer and maintaining software be prohibitive for a substantial number of students?" (p. 8).

They conclude by saying that distance education "research has a long way to go and that much of it is inconclusive" (p 8). Considering the date of the report and the fact that Web-based education was still in its infancy, this information seems to point to the fact that research and practice at that time was just beginning to uncover some of the strengths of the field.

Sener (2001) responds to Phipps & Merisotis (1999) by saying that they call for an "absurd level of research verification" (para. 3) when classroom instruction has not been called under this reports' microscope for similar examination of quality and effectiveness. Lockee, Moore & Burton (2001) state that these media comparison studies miss the point because they only compare delivery mechanisms, not instructional strategies or any of the other variables that have an affect on a learning environment. They also point out that these comparison studies "do not test any theoretical foundation-they simply evaluate one instruction delivery technology against another" (p. 61). Moskal & Dziuban (2001) add that "obvious outcome comparisons associated with web-based learning and traditional on-campus education may be intuitively appealing, but they do not facilitate responsive programs" (p. 13).

Additionally, many have called into question the assumption that classroom, or F2F instruction, is the gold standard by which all other instructional

environments and strategies must be compared (Conger, 2005; McDonald, 2002; Sener, 2004; Young, 2002).

'F2F is not the gold standard that it's held up to be,' says Chris Dede, professor of learning technologies at Harvard University's Graduate School of Education. 'Many people find their voice in distance media in a way that they don't in F2F sessions,' he says. A shy student, for instance, might never participate in a classroom environment, but the student might frequently speak up in online forums where students have more time to think before they comment. And not all students learn the same way, Mr. Dede argues, so presenting materials in a range of formats can help make sure every student is fully engaged in at least some class activities. (Young, 2002, *Once a Taboo Idea*, paras. 4 - 6)

There are good reasons to move beyond the NSD syndrome to examine web-based and online education in a way that will add to the research and possibly inform practice. In regard to Internet technology, a more productive research agenda would be to examine how best to use the unique capabilities of the technology (Conger, 2005) and to find "what combinations of instructional strategies and delivery media will best produce the desired learning outcomes for the intended audience?" (Joy & Garcia, 2001, p. 38).

Better Than F2F

Results from research studies conducted over the most recent decade are beginning to show different results than the 355 NSD studies. Hiltz et al. (2001) compared 19 studies and found asynchronous learning networks to be as good or more effective for student satisfaction and learning outcomes than F2F when looking at course mode or delivery, student outcomes and quality of instruction.

Dziuban, Hartman, Moskal, Sorg & Truman (2004) found higher student outcomes in courses using a blend of online and F2F instruction and delivery.

Dzuiban et al. (2003) point to the uniqueness of Internet technologies to transform teaching and learning in higher education. "Previous educational technologies, such as instructional television, have tended to replicate the classroom environment and its traditional teaching methods. Web-based learning environments invite – and may even require – reconceptualization of the learning paradigm" (p.1). White, Roberts & Brannan (2003) take this further "unless the course is reconceptualized using an interactive learning pedagogy, the results are nothing more than a correspondence course via e-mail and that simply transferring a traditional classroom-based course to an online format is doomed to failure" (p. 172). Saba & Shearer (1994) recommended that research and design need to move away from the physical science definition of distance education towards the social science definition of transactional distance put forth by Moore (1996).

Twigg (2001) reported on the results of the fourth annual Pew Symposia in Learning and Technology, convened in 2000 to address the "major challenges of higher education: improving quality, increasing access, and reducing costs" (p. 4). The participants were all from institutions and programs that were already moving beyond the no significant different syndrome and using innovative approaches to online education. Five areas of innovation were identified and examined; individualization, improving the quality of student learning, increasing

access to higher education, reducing the costs of teaching and learning, and sustaining innovation. Innovations that maximize the unique potential of the Internet rather than bolting technology onto existing, traditional, face-to-face schemes, will ensure the continued improvement and success of online education. In terms of course design and instruction, innovation calls for learner-centered design and instruction that “treats students as individuals, rather than as homogenous groups. Rather than maintaining a fixed view of what all students want or what all student need, we need to be flexible and create environments that enable great choice for students” (p. 5). Learning environments need to be learner-centered, flexible and accommodate differences in learning strategies.

This individualization will also improve the quality of student learning. The idea behind using IT to focus on the learner is to “think about how to utilize technology to improve learning.....focus on what we can do with IT [Instructional Technology] that we cannot do without it” (Twigg, 2001, p. 9). Fundamentally different thinking about the learning environment means moving away from the one-size-fits-all model and the idea of transferring the teacher-centered classroom model to the online environment. “The idea is to create what has been called a ‘resource’ model, an environment in which student interact and wrestle with learning materials directly (or in teams), under the tutorial guidance of a mentor” (p. 9). The ability of the Internet to access resources that extend beyond the limits of the institution and the instructor allows for greater choice of assignments to meet their particular needs.

Creating these types of learning environments are facilitated by a higher level of instructional design assistance. Most courses are crafted by an individual professor, limiting the potential of that environment to the design and pedagogical expertise of individual teachers (Saba, 2005). Innovative institutions are increasingly involving teams of experts in the design and development process that include instructional designers, student support specialists and technical/media experts (Dziuban et al., 2004; Lee & Dziuban, 2002; Saba, 2005; Twigg, 2001). For many instructors, this is the first time they have ever been exposed to any type of design and/or teaching methods, so designing an online course can significantly impact their face-to-face teaching as well (Moskel & Dziuban, 2001).

Evaluation of Course Design and Instruction

To continue the examination of the online courses, the review must split into two separate categories; design and instruction. There are three distinct phases of instructional design in any design process:

- the design plan (created before the course is actually designed)
- the design realized (developing the course following the design plan)
- the design in practice (the instructional phase when the course is actually taught) (Rhodes, 2003)

The distinction between course design and instruction is more clearly delineated in online courses for two reasons:

1. Course design and development is generally finished before the course is taught, rather than course preparation as an ongoing activity during the semester
2. The use of course teams divides the design and development tasks up between team members, which in a few instances means that the instructor does not participate directly in the design and development of the course.

Course design can be evaluated for quality and effectiveness even before the course is taught (Quality Matters, 2005a). There are specific areas of design important to any course, but particularly important in an online course.

Instructional design methods that include formative and summative evaluations of the design, are an important part of a well-designed online course (Dick & Carey, 1990; Gagné, Briggs, & Wager, 1992).

Separate from the design is the instruction, or the design in practice; that is, how the course is actually taught or facilitated. Formative and summative evaluations should be an integral part of any course, as they allow the instructor to stay connected to the students, and to evaluate how effective the design and instruction is in supporting their learning. Students should be given opportunities throughout the course to give feedback to the instructor on the ease of use of the technology and on the course content (Chico State University, 2005).

“Instructional design without formative evaluation is incomplete” (Gagne et al, 1992, p. 30). Both Dick & Carey (1990) and Gagne et al. (1992) call for formative

evaluation to be conducted before the course is offered to the target audience. But formative assessment can also happen while the course is being taught using student feedback.

A few institutions are adopting the distributed functions model first conceived by Wedemeyer, wherein the course may be designed by a team of developers that include subject matter experts, instructional designers and media or technology developers (Dziuban, Hartman, Moskal, Sorg, & Truman, 2004). The subject matter expert may also be the instructor, the one to realize the design in practice. In trying to determine what aspects of online education work better than F2F education, one must consider design and instruction separately, and look for aspects of quality and effectiveness.

Seven Principles – A Basis for Quality

Webster's New World Dictionary defines quality as "the degree of excellence which a thing possesses" (Webster's New Word Dictionary, n.d.). Dictionary.com says, "Degree or grade of excellence" (Dictionary.com, 2005). Some synonyms for quality are property, attribute, character, or trait. Assessing quality then would involve examining various properties, attributes, characters, or traits of an online course and the degree to which each meet a measure of excellence or perhaps an identified best practice (Quality Matters, 2005a). To establish what measurement to use in assessing quality in online courses, we turn to the research journals of higher education.

A seminal study by Chickering and Gamson (1987) titled Seven Principles for Good Practice in Undergraduate Education in Effective Teaching Practices was published in 1987 in the American Association of Higher Education (AAHE) Bulletin. The authors examined 50 years of research on the undergraduate experience. With a focus on improving undergraduate education, seven principles were identified that were intended to guide and direct students, faculty members, administrators and student support personnel towards higher quality in post-secondary education. The Seven Principles have been used at many institutions to help improve their teaching practices and education experiences (Graham, Cagiltay, Lim, Craner, & Duffy, 2001).

The Seven Principles (Chickering & Gamson, 1987) are as follows:

1. Encourages contacts between students and faculty
2. Develops reciprocity and cooperation among students
3. Uses active learning techniques
4. Gives prompt feedback
5. Emphasizes time on task
6. Communicates high expectations
7. Respects diverse talents and ways of learning (p. 4 - 6).

Seven Principles - Technology as Lever

Chickering and Ehrmann (1996) revisited these principles in relation to the emerging communication and information technologies. They examined the “most cost-effective and appropriate ways to use...[these] technologies to

advance the seven principles” (p. 3). The authors also point to communication technologies as being the best and most effective use of technology in encouraging contact between students and teachers. In particular, asynchronous communication provides more opportunities for interaction between students and teachers. It allows for expanded access outside of the classroom and more convenience for commuter and part-time student who are not on campus the majority of time during a semester. The authors also point out that communication technologies make it easier to reach and interact with a diverse student population because it provides time for reflection in writing responses and a level of safety in expression that is not available in the classroom.

Communication technologies have also increased opportunities for students to interact with each other; supporting the second principle of reciprocity and cooperation among students. One of the surprises from the student use of computers is the “extent to which computer-based tools encourage spontaneous student collaboration...” (Chickering & Ehrmann, 1996, p. 4). E-mail and discussion boards are effective tools to use for learning teams. Geographically dispersed students can work together on various problems, even helping each other out with the software being used for the class. These tools make cooperative and collaborative team projects possible.

Active Learning is the third principle and Chickering & Ehrmann (1996) categorized the plethora of tools used in active learning under three labels: learning by doing, real-time conversation, and time-delayed interaction.

Computer technology can help in “apprentice-like activities” (p.5) through tools used in statistical research, information gathering, simulation software, and creation software.

Principle four sets forth the advantages of prompt feedback. There are many ways in which computers can provide feedback. E-mail communication, interactive web activities that give immediate feedback to the user, self-tests, online quizzes, the ability to use media on web pages for effective feedback, and the ability to review and critique a student’s writing for immediate feedback, are just some of the ways that computer technology has increased the range and scope of feedback opportunities to enhance learning.

In terms of time on task, the fifth principle, new technologies can increase efficient use of time through the use of online access to libraries and communication with the teacher and fellow students. They can work on their assignments from home without having to spend time commuting to campus to go to the library or meeting face-to-face with their learning team.

High expectations are implicit in web-based education for both students and instructors. If a teacher uses a sloppy webpage for a class, the students are quick to assume that the teacher has low expectations of them because this is what he/she modeled. It is imperative that course materials be of high quality so a level of high expectation can be promoted. Additionally, when students publish their work on the Web for other students to see, they tend to raise their own level

of quality, knowing that their work will be reviewed by their peers. They put forth extra effort to make their work better.

The last principle concerns respect for diverse talents and ways of learning. Technology can support diverse learners because it allows instructional activities to be conducted through many different processing channels. It can support visual, kinesthetic, and auditory learners. It can support different personalities of learners, from the needy to the self-sufficient, and can provide opportunities to engage with the material in many different ways. Finally, it provides opportunities for learning in a social and collaborative environment.

Chickering & Ehrmann (1996) close their article by saying that technology alone is not enough. Technophiles alone cannot improve education with these principles, nor can faculty alone. It takes faculty, students, technology personnel, and administrators to work together towards this goal.

Principles Used for Evaluating Online Courses

As a result of the 1987 Chickering & Gamson article, many institutions across the continent used the resulting inventories to evaluate their own undergraduate programs and make improvements. The seven principles have become a widely-used framework for evaluating quality in traditional, face-to-face courses. Additionally, these principles have been used to evaluate online courses and have been incorporated into the design and development process of creating online courses. Indiana University's Center for Research on Learning and Technology (CRLT) used the principles to evaluate a group of online courses

(Graham et al., 2001). An outcome of these evaluations was a “list of ‘lessons learned’ for online instruction that correspond to the original seven principles” (para. 3). These lessons learned provide direction and guidance in the development of online courses, as well as evaluation of existing courses. The evaluators were pleased with the results and felt that “using the seven principles as a general framework for the evaluation gave us insights into important aspects of online teaching and learning” (para. 17).

Indeed, the Seven Principles have been “widely referenced in the literature of higher education and technology-enhanced education” (Achtemeier, Morris, & Finnegan, 2003, p. 7). They lay a solid foundation of what to look for in quality courses. The principles are easy to understand and broad enough to cover any discipline. They are easy to identify and implement in courses, both on campus and online. Thus, they can be used as a general framework for the evaluation and assessment of quality in online courses.

Tools for Evaluating Quality

A search of the Internet using a popular search engine and the terms rubrics and evaluating online courses (Google, 2005) revealed a number of different tools that various institutions and organizations have developed in order to try to assess and capture quality in online courses. Some of the better design rubrics are from California State University, Chico (2005, para. 3); Quality Matters (Quality Matters, 2005a), a collaborative project from 19 higher education institutions and systems in Maryland; and WebCT’s Exemplary Course Project

(WebCT, 2005). Some institutions have used checklists, but rubrics provide a more concise measure of quality for a wider range of components of online courses. The categories used by all of these rubrics generally fall under these labels: course design/organization, course development, interaction/collaboration, assessment, technology, learner support, and evaluation and maintenance, or some variation or combination of such.

Assessing Quality in Course Design and Instruction

Quality and effectiveness in course design can be, and should be, evaluated before the course is taught. Most of the afore-mentioned evaluation instruments look at different aspects of course design in review processes that occur before the course is taught.

Rubric for Online Instruction (ROI). A committee convened in 2002 comprised of faculty, staff, administrators, and a student from Chico State University to review best practices and quality in online courses. “In order to draw from the expertise of the scholarly community, the committee first reviewed existing best practices, learning styles, and standards (e.g., Graf and Caines' WebCT Exemplary Course Rubric, Bloom's Taxonomy, Chickering & Gamson's 7 Good Teaching Practices in Undergraduate Education)” (Chico State University, 2005, Background of Rubric for Online Instruction, para. 1). The resulting rubric, Rubric for Online Instruction (ROI), sets guidelines for developers of online teaching, but also helps in the development and evaluation of online courses. The criteria are listed under 6 categories:

1. Learner support and resources
2. Online organization and design
3. Instructional design and delivery
4. Assessment and evaluation of student learning
5. Innovative teaching with technology
6. Faculty use of student feedback.

The levels of criteria are labeled as baseline, effective, and exemplary.

Quality Matters Rubric. “The Quality Matters project proposes to develop a replicable pathway for inter-institutional quality assurance and course improvements in online learning. It will create and implement a process to certify the quality of online courses and online components” (Quality Matters, 2005a, About QM, para. 1) This rubric only looks at course design, not instruction. The rubric uses eight broad categories and forty criteria that assess quality for online courses based on research literature and national standards, including Chickering and Gamson’s (1987) Seven Principles and Chickering and Ehrmann’s (1996) article. The categories used are:

- course overview and introduction
- learning objectives (competencies)
- assessment and measurement
- resources and materials
- learner interaction

- course technology
- learner support

WebCT's Exemplary Course Project Rubric. WebCT has been selecting courses for the Exemplary Course Project award since 2002. The rubric is used to assess and evaluate the courses submitted for the award. Although they call it a rubric, it does not include levels of quality, only criteria. Regardless, the rubric is very complete and would be a model for a review document that could be used in conjunction with a more detailed rubric for assessing quality in online courses. The categories used in the rubric are: course design, interaction and collaboration, technology, assessment, and learner support (WebCT, 2005).

These rubrics give us a foundation of what might be considered in a discussion of what is more effective and successful in the online environment.

Two Audiences

There are two audiences to consider in any learning environment; students and teachers or facilitators. Each occupies a unique role in the interchange that happens when learning occurs.

Students. Student success and satisfaction is closely connected to the teacher's perceptions of effectiveness (Bollinger & Martindale, 2004). Additionally, since faculty members are assessed and the quality of programs is evaluated in part on student satisfaction, it would seem prudent to investigate the components of online development and delivery that will promote student

satisfaction. Thus, a review of student characteristics and perceptions with respect to satisfaction and success in online education is included.

Meeting student needs to promote a good learning experiences has long been the goal of education. If the student has a good learning experience they are more likely to be successful in their educational endeavors. Student satisfaction may not have a direct correlation to success, but satisfaction is linked to motivation, and motivation is a predicting factor of student success (Bollinger & Martindale, 2004).

The makeup of the students who will be and are coming of age and entering higher education institutions is rapidly changing. Today's youth use the Web as a means for expression and communication. The Web is an integral part of the world into which they were born and raised (Web-Based Education Commission, 2000). Additionally, the student population at institutions of higher education is very diverse and understanding the needs of individual learners is critical (Benke, Bishop, Thompson, Scarafiotti, & SchWeber, 2004). "Differences among the Boomer, GenX, and Millennial students are more pronounced in the digital learning environment. While online learners need convenient student support services, satisfaction with such services may vary according to the student's generation as well as with the particular student's goals" (Benke, et al., p. 17).

Marc Prensky, a well-known author on game-based learning, characterizes Digital Immigrants as mainly Baby Boomers who are moderately

comfortable with digital tools and Digital Natives as those GenXers and Millennials who grew up with computers and/or with the Internet and can easily use digital tools to experience knowledge (Prensky, 2001) According to Benke et al. (2004),

A digital immigrant may prefer a convenient but more high-touch type of support experience such as advising over the telephone combined with access to a web portal. On the other hand, a digital native's perception of a satisfactory advising service may include push/pull web design where a student can easily chart his/her progress toward a degree online and be provided with just-in-time reminders (p. 17).

Benke et al. also report that "86% of college students compared to 59% of the general population have gone online, that 49% of students first began using the Internet before they arrived at college"(p. 19). They have already incorporated technologies such as Instant Messaging into their everyday life, using it twice as often as their older counterparts. "Likewise, this ubiquitous use of the Internet by today's college students foretells of more demand upon institutions to provide students with easy online access to information" (p. 19). The Internet is seen as a functional tool that has changed the way we as a society interact with each other and with information in our daily lives. Students use the Internet to get to information about academic advising, course and program descriptions, current events, using email to arrange meetings with professors and to subscribe to academic or discipline specified list-servs.

Some research shows that although students would prefer to learn in a physical, F2F classroom, they demand being able to learn at a distance because

it suits their current lifestyle and situation (Card & Horton, 2000; Maushak & Ellis, 2003; Simonson, Smaldino, Albright, & Zvacek, 2003).

The convenience of not having to drive long distances was more important than the F2F contact. One ... student commented during the focus group that "Taking the course via the Internet eliminated a commute and allowed freedom to complete coursework within my time constraints. Working full-time affects my ability to take courses with the long commute" (M. G. Moore & Kearsley, 1996, p. 242).

Other research shows no preference for classroom instruction over online instruction (Allen, Bourhis, Burrell, & Mabry, 2002), others prefer to do part of their learning online as indicated by increasing enrollment rates in online courses by on-campus students (Dziuban, Hartman, & Moskal, 2004; Dziuban, Hartman, Moskal, Sorg, & Truman, 2004; Dziuban & Moskal, 2001). Even though part of their decision is based on flexibility, convenience and access, many "also prefer the enhanced interaction and educational quality that an online course can offer" (Harasim, 2000, p. 58). For some, being able to access educational programs from any geographic location has meant that they could participate in programs that otherwise would have been literally beyond their reach (Bollinger & Martindale, 2004; Twigg, 2001). "[For] multiple-role adults, independence from time limitations has meant that they could finally fit educational activities into their already-full lives" (Benke, et al., 2004, p. 15).

What is student satisfaction? According to Bolliger & Martindale (2004), student satisfaction can be defined as "the student's perception pertaining to the college experience and perceived value of the education received while attending

an education institution” (p. 62). High levels of student satisfaction result from a number of factors: convenience of access, course/program quality; administrative, instructional and technical support and opportunities for personal interaction, just to mention a few (Benke, Bishop, Thompson, Scarafiotti, & SchWeber, 2004; Card & Horton, 2000). Student satisfaction should be interpreted “as a blend of meeting the student's needs, meeting unexpressed needs, faculty and programmatic expectations and societal needs” (Sener & Humbert, 2003).

The question can be asked then: what is optimal student satisfaction? Sener and Humbert (2003) give this answer, “At first glance this may seem like an easy question to answer: the more satisfied the students, the better. In reality, however, to some extent there is a fundamental contradiction between maximizing student satisfaction and providing the best possible learning experience” (p. 7).

Flexibility, convenience, time and place independence will be initial considerations of student satisfaction, but “will only be sustained through a satisfying and successful learning experience” (Garrison & Cleveland-Innes, 2004, p. 30). Research evidence suggests that for many students, asynchronous learning network (ALN) programs “provide a high level of satisfaction, particularly regarding ... the emphasis on interpersonal interaction” (Rovai, 2002, p. 320). Garrison and Cleveland-Innes (2004) state, “The challenge of providing students with what they need and not just what they want, argues for participation in a

community of learners and the need for role adjustment. Active participation in a critical community of inquiry is not a common experience for most undergraduate students” (p. 31). We are beginning to recognize that ALNs have the properties and potential to support higher-order learning activities and outcomes in highly interactive communities of learners. ALNs also hold out the possibilities for significantly different learning environments and experiences that impact both the student and instructor (Garrison & Cleveland-Innes, 2004).

The American Psychological Association (APA) states that social interaction and collaboration in learning environments lead to positive learning outcomes (American Psychological Association (APA), 1997; Angeli, Valanides, & Bonk, 2003). Collaborative learning tools can improve student satisfaction in the online learning environment (C. Gunawardena & Zittle, 1998). With collaborative online tools such as threaded discussion and chat functions, students share ideas and viewpoints with each other. Other tools include e-mail, digital audio and video files, and web pages (Belanger & Jordan, 2000). They are exposed to viewpoints and perspectives they normally would not have considered (C. J. Bonk & Cunningham, 1998). “This type of social interaction environment can facilitate meaningful learning experiences” (Bollinger & Martindale, 2004, p. 63).

Many institutions are using course management systems such as WebCT, Blackboard and eCollege. These systems have many tools integrated into a single management system. Some instructors have developed their own web

pages and use these tools in conjunction with their web site. Researchers have found that “communication software that increased the quality of instruction raised students’ level of motivation due to greater access to their instructors and increased their satisfaction with outcomes” (Bollinger & Martindale, 2004, p. 62).

Community or a sense of community has been shown to be a significant factor in student satisfaction. A sense of community provides the support to work together and challenge one another (Davie & Wells, 1991). In support of this argument, Rovai (2002) found a “positive significant relationship between sense of community and cognitive learning” (p. 328).

Because funds for development and delivery of these resources are limited, “careful assessment of needs, planning, monitoring, and research and evaluation are necessary to ensure that resources are invested in services that students studying at a distance want, need, and, perhaps most important, will use” (Benke, et al., 2004, p. 15).

Faculty. Faculty report that increased access to and by students is one factor that contributes to a satisfying teaching experience. Other factors include more convenient opportunities for high quality interaction with students and more flexibility for teaching that is time and place independent (Benke et al., 2004). “Related factors that contribute to student satisfaction are more immediate access to their instructors, increased opportunities for interaction with them, and quick turn-around time for feedback” (p. 16). Keeping learners involved and motivated means giving feedback on assignments in a timely manner. “Student

satisfaction has a strong positive correlation with the performance of the instructor, particularly with his or her availability and response time....The instructor's feedback in the most important factor in satisfaction with instruction" (Bollinger & Martindale, 2004, p. 62). The instructor must communicate with students on a regular basis. Feelings of isolation and high levels of frustration and anxiety occur when communication and interaction between the different parties are lacking (Mood, 1995).

Additionally, technology can enhance feedback to students because it allows for immediate access to the instructor and fellow students for answers regarding assignments, questions, and revisions on papers (M. G. Moore & Kearsley, 1996, p. 240). Swan (2001) found that students "who rated their level of activity as high also reported significantly higher levels of course satisfaction and significantly higher levels of perceived learning" (pp. 315-316).

Interestingly enough, one study conducted at the State University of New York (SUNY) on student satisfaction showed that even though the students value interaction with their peers, this did not correlate with reported student satisfaction or student learning (Shea, Fredericksen, Pickett, Pelz, & Swan, 2001). "As educators, we may need to be more specific clear about the expectations for social interaction. Some of it is just social, some of it is directed at learning objectives, and both have value. This also has impact on faculty relationships and their role in promoting student satisfaction" (Benke et al, 2004, p. 22).

Conversely, in a later study at SUNY, Shea, Swan, Fredericksen & Pickett (2002) found that satisfaction and learning were significantly correlated with interaction, feedback and clear expectations from a learning perspective. Thus, attention must turn to learning and teaching interactions. Collaboration and independence together represent the distinctive properties of online learning and provide opportunities for both discourse and reflection, critical thinking and problem solving (Garrison, 2003). Integration of these capabilities will promote realization of quality learning environments, promote satisfaction, and enable successful outcomes (Garrison & Cleveland-Innes, 2004). Social presence that only provides a sense of connection without purpose leads neither to satisfaction or success. Social and cognitive presence must be integrated through teaching presence to ensure intended goals are realized efficiently and effectively (C. N. Gunawardena et al., 2001; Wise, Chang, Duffy, & Del Valle, 2004). This integration of the external and internal, the collaborative and the reflective, is the key to higher-order learning and reflects the key properties of online learning (Garrison, 2003).

As discussed earlier, learning communities consist of three core elements: social, cognitive, and teaching presence. Critical discourse and reflection is supported and encouraged when all three elements are harmoniously integrated. When one or two elements are ignored, the “sustainability of the learning experience is threatened” (Garrison & Cleveland-Innes, 2004, p. 31), resulting in a loss of satisfaction and success. Focused interaction promotes critical

evaluation and synthesis of ideas, thus moving the communication transaction from being purely social to cognitive. In the online environment, communities of inquiry with focused interactions are essential to successful higher-order learning outcomes (Perry & Edwards, 2005).

Adjusting to new roles can empower students and facilitate higher levels of learning. Students should be provided with opportunities to become self-directed learners and move towards structuring their own learning experiences (Wegerif, 1998). For example, students who are merely reiterating what the course material stated can be encouraged through carefully designed questions to think more critically. Additionally, students who are not actively involved, and may fall behind in course assignments can be encouraged to become more active by taking the lead in some discussions (Garrison & Cleveland-Innes, 2004; Palloff & Pratt, 2001). Some students will need support and encouragement to project themselves within the community. Others need support to be cognitively present and require guidance in synthesizing, applying and evaluating information. Shea et al (2002) reported the highest correlation between satisfaction and the quality of interaction with the instructor. "It would appear that teacher presence in the form of facilitating interaction and a sense of community is a crucial role in the adjustment, satisfaction and success of online learning" (Garrison & Cleveland-Innes, 2004, p. 34). They continue to state that "Only through teaching presence can the full integration of cognitive and social elements be realized and a community of inquiry be created online" (p. 35).

These principles are true in the blended learning environments as well. “Blended learning represents significant rethinking and a shift in design. It is not sufficient to simply add a chat room or even discussion board onto a classroom based approach. A key element of blended learning and student satisfaction is interaction” (Garrison & Cleveland-Innes, 2004, p. 34).

Teaching presence should not remain the sole responsibility or role of the instructor. “Engagement in a community of learners should encourage students to provide teaching presence as well. Students themselves are a valuable resource that should be valued and utilized” (Garrison & Cleveland-Innes, 2004, p. 34). The instructor is not only a facilitator of learning but also a motivator for the student (Bollinger & Martindale, 2004; Bonk & Cummings, 1998; Palloff & Pratt, 2001).

Glenn, Jones, and Hoyt (2003) report that students perceive higher achievement from courses that emphasize online interaction. “Other research suggests that quality distance education requires that students have access to the instructor and other students for responses to questions, reassurance of ideas, and social contacts within the technology driving the system (p. 288; see also Bonk & Dennen, 1999; Moore & Kearsley, 1996; Swan, Shea, Fredericksen, Pickett & Pelz, 2000).

Rovai (2002) indicates that those students who possess strong feelings of community are more likely to persist than those students who feel alienated and alone. Therefore, one strategy to help increase retention is to provide students

with increased affective support by promoting a strong sense of community by making “available a larger set of resources in the form of other learners who can be called upon to assist learning” (p. 328). Such a strategy has the potential to reverse feelings of isolation and, by making connections with other learners, to provide students with a larger base of academic support by increasing the flow of information among all learners. “Online learners who have stronger sense of community and perceive greater cognitive learning should feel less isolated and have greater satisfaction with their academic programs, thereby resulting in fewer dropouts” (p. 328).

Many times students assume that increased teacher presence means access to their instructors is constant, 24 hours a day, seven days a week. This leads faculty to the perception that must always be online, which accounts for a decrease in faculty satisfaction (Benke et al, 2004). “Institutions need to ensure that student satisfaction is not achieved at the expense of faculty satisfaction, since a committed faculty will be a major determinant in the ultimate success of online higher education” (p. 16). This requires a rethinking of internal process and practices from traditional classes that do not work well online. Classroom management techniques are very different online than they are in the classroom. Faculty need to manage student expectations concerning availability and response time by stating them clearly at the beginning of the course. Students also need to know what the course goals and objectives are at the beginning of the course, as well as what is expected of them (Mood, 1995). Thus, Glenn,

Jones, and Hoyt (2003) point out that interaction doesn't occur unless it is intentionally designed into the instructional program.

Role Adjustments

Online tools are driving a “more complex and sophisticated design of learning experiences which represent a significant challenge and role adjustment for students” (Garrison & Cleveland-Innes, 2004, p. 29). Instructors and administration are also experiencing “a shift in roles that has contributed to a mismatch between what is assumed are important resources and services for online students and what they really want and need” (Benke et al., 2004, p. 15).

Re-conceptualization of the roles of instructors and students is necessary to form communities of inquiry online (Harasim, 2000; Perry & Edwards, 2005; Rourke, Anderson, Garrison, & Archer, 1999). This means there will be a redefining of roles for both the student and the instructor as students learn new skills and become empowered to be independent and responsible learners and instructors become more comfortable with the adjustment in their role from didactic lecturer to mentoring facilitator (Davie & Wells, 1991; Dziuban, Hartman, & Moskal, 2004; Dziuban, Shea, & Arbaugh, 2005; Garrison & Cleveland-Innes, 2004; Gunawardena, 1992; Knowlton, 2000; Perry & Edwards, 2005). This role adjustment is not inevitable and requires teaching presence in the design and delivery of the instruction. “The instructor supports and guides this adjustment. It is a continual shifting of expectations and requirements of individual interaction within the community” (Garrison & Cleveland-Innes, 2004, p. 32). The challenge

presented is that most students do not have the skills necessary to engage in critical discourse online. They believe that the posting of their ideas and thoughts is critical discourse when in fact it is merely *talking*. Many instructors do not know how to model and facilitate purposeful online discussion; so many institutions provide training in how to teach online. Without the instructor modeling the appropriate types of interactions, many students will never experience the benefits of participating in true critical discourse (Garrison & Cleveland-Innes, 2004; Palloff & Pratt, 2001).

Learning through the use of technology takes more than mastering a software program or feeling comfortable with the hardware being used. Students in online learning situations need to come to an awareness that learning through the use of technology significantly affects the learning process itself (Palloff & Pratt, 2001, p. 108).

The learning process is much more collaborative and interactive, but also reflective in nature.

Learning communities provide students with opportunities to test appropriate behaviors and new roles (Gaensler, 2004). Consideration of support and guidance in role adjustment is necessary to enable more productive learning interactions in the online environment. “The challenge of providing students with what they need and not just what they want, argues for participation in a community of learners and the need for role adjustment. Active participation in a critical community of inquiry is not a common experience for most undergraduate students” (Garrison & Cleveland-Innes, 2004, p. 31).

There are different ways to conceptualize this learning experience. Garrison and Anderson (2003) point out three core elements of learning communities for educational purposes: “social, cognitive and teaching presence” (p. 27). Moore and Kearsley (1996) identify three types of interaction in distance learning environments: learner-content, learner-learner, and learner-instructor.

What Works Better Online

Bonk and Cummings (1998) examined the web-based environment using the APA’s Learner-Centered Psychological Principles (1997) as a lens and devised twelve recommendations for using the Web’s unique capabilities to put the learner at the center of the learning process. Although not all of these recommendations will ensure a better than F2F experience, there are a few that stand out as being far superior to classroom instruction. One aspect of using the Web in instruction is that it is possible for students to have access to “information and resources that extend thousands of time beyond the instructor’s current and potential knowledge base” (p. 84). Additionally they point out that with the Web, cross-cultural collaboration and feedback is possible, extending the reach of possible feedback and interactions of the students with national and international peers and experts (Bonk & Cummings, 1998; Harasim, 2000), something that is logistically possible, but much slower to do in the classroom.

Many practitioners point out that the nature of asynchronous communication using the Web or computer-mediated communication software allow and promote higher levels of participation because all students can be

heard through their posts, not just the more vocal and aggressive students, as is often the case in the classroom (Whiteman, 2002). Asynchronous discussions also allow for the time needed to write thoughtful, well-crafted responses, supported by the fact that there is a permanent record of the discussions that allows both student and instructor to read back through past discussions, reflect on the flow and formation of the ideas and formulate their ideas in response to many different ideas presented at various time in different conversations. Harasim (2000) adds to this stating, “Not only does it enable access to learners with family or employment commitments, the 24/7 access expanded air time for discussion and reflection, allowing everyone to have a voice, overcoming challenges, and traditional discrimination factors, such as ageism, sexism, and racism” (p. 53).

Others have stated that the online environment evens the playing field for all students so that those who are shy or quiet have a chance to be heard and participate online (Harasim, 2000). Bonk and Cummings (1998) agree and argue that the online environment is safer than F2F for all students to express ideas that are contrary to majority opinion, disagreements are voiced and encouraged, and ideas can be expressed without fear. It also can “force them to externalize their personal biases and visions” (p. 85) and help them to connect their thinking and knowledge construction with real world situations. Harasim (2000) also points out that “Online interaction thus displayed fewer of the extremes typical of F2F class activity such as excessive or dominating input by a few and little or no

participation by everyone else in the class. Online environments do not entirely eliminate the more vocal participants. What is new and different is that conferencing ensured that dominance by a few does not prevent others from having their say" (p. 49).

Quality and better outcomes do not just happen when one puts their course materials online, or when one adds asynchronous discussions to a course. Harasim (2000) states that "[t]o meet the criterion of quality programming, a virtual university must employ top quality faculty and instructional staff, produce high-level academic curriculum and resources, use group discussion and project activities for most if not all the coursework, produce demonstrable results, and provide integrated coherent and cohesive degree/diploma programs, not just assorted courses" (p. 59).

Elements of Quality: The Sloan-C Framework

The potential to transform educational practices through online technologies has been highlighted in this study (Dziuban, Shea, & Arbaugh, 2005; Harasim, 2000; Hiltz, 1994). Although the technology in and of itself will not make this transformation, seeking effective ways to use the technology is a current challenge. Chris Dede comments on this situation,

We're facing the biggest gap between yesterday's workplace and tomorrow's that any group of educators have faced since the dawn of the Industrial Revolution a couple of centuries ago. And yet the very technologies that are creating this challenge are also providing an opportunity to meet it. In contrast to simply automating presentation, there's a lot that interactive learning technologies can do to address more powerful forms of pedagogy—based on learning by doing, collaborative

learning, and mentoring via apprenticeships. All these instructional approaches let students act rather than listen, do things inside the technology world that are impossible in the real world, and link to outside resources and communities of practice. So yes, new interactive media give us a kind of opportunity that educational technologies have not had until now—a chance to change our pedagogy in ways that really open up powerful content to students (Wright, 2002).

Changes in pedagogical uses of these technologies are shifting the role of both instructor and student. Thus, the discussion turns to “teachers and learners online engaging in more collaborative relationships” (J. C. Moore, 2002, p. 7).

Pillars of Quality

Five pillar of quality have been created to guide the institutional improvement process. Each pillar identifies goals and benchmarks that help measure progress towards achieving the goal of providing quality in the online learning environment (J. C. Moore, 2005). There are five pillars: learning effectiveness, cost effectiveness, access, faculty satisfaction, and student satisfaction. All pillars are interrelated such that an aspect of the online learning environment may not fit neatly or completely under one pillar, but may lie across all or some of the pillars. For example, interaction may come under learning effectiveness but also access, student satisfaction, and faculty satisfaction.

The pillars, as written, focus on the institution as the entity that examines how its online programs meet the goals described for each pillar. Practical application of the pillars recommendations can be applied at the course design and instruction level to inform good practice in an effort to increase quality of courses. At this level, cost effectiveness does not play as important a part,

although it should not be discarded completely. Course designers and instructors may realize how they need to be supported by the institution in order to improve quality in online or web-based offerings. Requesting support and resources can be framed in terms of cost effectiveness as a benefit to the institution, as well as the instructor and students. In this analysis, the pillar of cost effectiveness is not examined separately, but is mentioned in connection to the other pillars.

Learning Effectiveness. The learning effectiveness pillar uses the good practices as summarized by Chickering and Gamson's Seven Principles for Good Practice in Undergraduate Education (Chickering & Gamson, 1987). In 1994, Chickering and Ehrmann (1996) comment on the ways in which technology influences practices,

The biggest success story in this realm has been that of time-delayed (asynchronous) communication.... electronic mail, computer conferencing, and the World Wide Web increase opportunities for students and faculty to converse and exchange work much more speedily than before, and more thoughtfully and "safely" than when confronting each other in a classroom or faculty office. Total communication increases and, for many students, the result seems more intimate, protected, and convenient than the more intimidating demands of face-to-face communication with faculty (para 10).

Increased opportunities for interaction with the instructor and fellow students are provided in the online learning environment. Potential for creating more personalized learning experiences and formation of learning networks or community of learners are strengths of the online learning environment (J. C. Moore, 2002). Examined under the pillar of learning effectiveness are

assessment, community of learners, content, course design, student outcomes, and student feedback. The goals of the learning effectiveness pillar are:

- Interaction is key: with instructors, classmates, the interface, and via vicarious interaction
- Metrics are used for comparing online and traditional courses
- Online course design takes advantage of capabilities of the medium to improve learning (testing, discussion, materials)
- Courses are instructor-led
- Communications and community building are emphasized
- Swift trust characterizes the online learning community
- Distinctive characteristics of program are highlighted to demonstrate improved learning
- On-campus and online instruction achieve comparable learning outcomes, and the institution ensures the quality of learning in both modes by tracking instructional methods, student constituencies and class size (J. C. Moore, 2002, Quick Guide, p. 2)

Access. Access according to the Pillar Reference Manual “means that all qualified, motivated students can complete courses, degrees or programs in the disciplines of their choices” (J. C. Moore, 2002, p. 26). At the institutional level, this means providing the infrastructure and course management tools necessary to create stable access to learning environments and learner support services. The major themes emerging from the participant interviews include access, flexibility, visibility of the students, and effective use of student time.

The goals for the Access pillar are:

- Diverse learning abilities are provided for, including at risk, disabilities, and expert learners
- The delivery mechanism is continually evaluated for reliability and functionality
- Courseware that promotes learner-centered instruction is provided
- Student feedback is used for continuous improvement
- Students are able to take the courses they want, when they want
- Connects to multiple learning opportunities (J. C. Moore, 2002)

Faculty Satisfaction. The faculty experience of teaching online must be as effective and professionally beneficial as the F2F teaching experience (J. C. Moore, 2002). Faculty basically receive satisfaction from teaching online for the same reasons they do teaching F2F; to be able to connect and motivate students to become better learners and pursue and share knowledge. The goal for the Faculty Satisfaction pillar is, “Faculty are pleased with teaching online, citing appreciation and happiness” (J. C. Moore, 2005, p. 4).

Additionally:

- Faculty satisfaction metrics show improvement over time
- Faculty contribute to and benefit from online teaching
- Faculty are rewarded for teaching online and for conducting research about improving teaching online

- Sharing of faculty experiences, practices and knowledge about online learning is part of the institutional knowledge share structure
- There is a parity in workload between classroom and online teaching
- Significant technical support and training are provide by the institution (J. C. Moore, 2002, Quick Guide, p. 4)

Student Satisfaction. “The student satisfaction pillar measures students’ overall satisfaction with learning, teaching, affordability, and access...” (J. C. Moore, 2002, p. 42). Students expect convenience and flexibility in online programs. They want access to education that is independent of time and distance. They want to be able to take advantage of multiple ways of learning. They like choices between fully online and blended options, as well as synchronous and asynchronous modes. They prefer highly interactive courses that use problem-based or situated learning to connect what they are learning to real life application. They want technical support that is available all day, every day and they desire frequent and prompt feedback from the instructor throughout the semester. And they do not want to pay ‘an arm and a leg’ for their courses (J. C. Moore, 2002). The goal of the Student Satisfaction pillar is, “Students are pleased with their experiences in learning online, including interaction with instructors and peers, learning outcomes that match expectations, services, and orientation” (J. C. Moore, 2005, p. 4). In addition,

- Discussion and interaction with instructors and peers is satisfactory

- Actual learning experiences match expectations
- Satisfaction for services are at least as good as on the traditional campus
- Orientation for how to learn online is satisfactory
- Outcomes are useful for career, professional and academic development (J. C. Moore, 2002, Quick Guide, p. 5; See also J. C. Moore, 2005, p. 6)

Summary

This chapter discussed the research that has been conducted on many of the different aspects of online education in the areas of course design, delivery and course instruction. A history of distance education was included to lay a foundation for the type of research that has predominately been conducted, that of comparison studies between distance education and traditional, classroom instruction, and the justification for moving beyond this type of comparative study to a more focused study of the quality and effectiveness of online education. Evaluation tools that have been developed to review course design and instruction for quality and effectiveness were also discussed to provide a framework for the selection of participants and the examination of their perceptions and beliefs about what they feel they can do better online than in the F2F classroom. Lastly, research and discussion about what is unique about the online environment and what aspects of it create more effective and successful

learning environments is covered. Chapter three will present the methodology for this study