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DISSERTATION

**DISTANCE EDUCATION: COMMUNITY COLLEGE STUDENTS'
PERSPECTIVES AND ATTITUDES TOWARD ONLINE COURSES**

Submitted by

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School of Education

In partial fulfillment of the requirements

For the Degree of Doctor of Philosophy

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Fort Collins, Colorado

Spring, 2000

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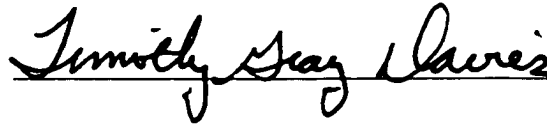
WE HEREBY RECOMMEND THAT THE DISSERTATION PREPARED UNDER OUR SUPERVISION BY ABDELMUHDI ALJARRAH ENTITLED DISTANCE EDUCATION: COMMUNITY COLLEGE STUDENTS' PERSPECTIVES AND ATTITUDES TOWARD ONLINE COURSES BE ACCEPTED AS FULFILLING IN PART REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY.

Committee on Graduate Work











Advisor



Director

ABSTRACT OF DISSERTATION

DISTANCE EDUCATION: COMMUNITY COLLEGE STUDENTS' PERSPECTIVES AND ATTITUDES TOWARD ONLINE COURSES

The purpose of this study was to establish evaluative data about online courses from community college online students. These data contributed to a growing baseline of information and knowledge that may serve to develop and improve of online courses. The first section of the research established a demographic profile of community college students taking online courses. The second and third sections explored some of the online students' perceptions and attitudes toward online courses

The analyses of the data revealed the following demographic findings (N=138). All online courses in this study were above the academic 100-level and were considered transferable courses. More females (69 percent) than male students were represented in the sample. The majority of the students were white (85 percent). Most of the students' ages were greater than twenty-five years old (77 percent). The majority of the participants were working full-time (83 percent). About 51 percent of the participants reported that they had children (aged 0-5 years old). Responses showed that all of the participants in this study used e-mail to communicate with their instructors, and 47 percent used bulletin boards. Thirty-two percent of the students used e-mail to communicate with other classmates.

The data revealed positive perceptions by students about the value of online courses. The data also revealed that: there were differences among community colleges about how students felt about online courses; there were statistically significant differences in mean scores between the overall satisfaction of males and females in their

perceptions toward online courses (females reported greater “Overall” scores than did males); there were no differences in mean scores between those of white ethnicity and others in their perceptions toward online courses; and there were statistically significant differences in mean scores between the older and younger groups in their perceptions toward online courses (older student reported significantly higher scores).

The numbers of online courses taken were not associated with differences in students’ perceptions toward online courses. Employment was not associated with differences in students’ attitudes and perceptions toward online courses. Finally, the subject’s family status (having children at home aged 0-5 years) did affect the overall perceptions and attitudes of subjects toward online courses.

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My journey of 25,000 miles from Aurora to Fort Collins is over!

None of us ever accomplishes a goal without the support of others, and as I reflect on the process leading to my Ph.D., I realize that I have had many supporters to whom I owe gratitude.

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CHAPTER I
INTRODUCTION
Background

Distance education programs are increasing in number and becoming one of the most important new trends in education. These programs, delivered using current technologies, provide new ways for students to learn and a variety of methods for facilitating interaction among students and between students and teachers. These programs may help in solving many educational problems. Today's students face many educational and employment challenges, and many of them grow disheartened with school because they find little relevance in education and their life outside school (Duttweiler & Shirley, 1993). According to Marshall and Tucker (1992) more than one quarter of all of American students drop out of school, and little is done to retain or retrieve those dropouts. Also, many small and rural schools face difficult obstacles providing equal access to quality education opportunities for all students, especially in courses such as foreign languages, higher-level mathematics, science and other areas as well. Distance education may present alternative options for teaching these courses. In two recent studies, a significant number of students believed that taking a course via distance delivery was worthwhile because they perceived that quality education could be delivered in such a manner (Hijazi, 1998; Moriarty, 1997).

The Internet and the World Wide Web (WWW) have become pervasive in the academic realm, particularly in the coursework required to achieve success in higher education. According to Strong and Harmon (1997), the Internet has been extended far beyond its original scope as a highly specialized scientific communications network for the defense establishment and major research universities possessing high capacity computers. The Internet has become the most recent focus for education (Lundin, 1998). It not only can comprise the information, knowledge, and wisdom of the great thinkers of the world, past and present, but it can also contain information from literally anyone from anywhere (Lundin, 1998). It is becoming the information super-highway that serves all the academic disciplines from physics to classic literature. Distance learning and the research resources available on the Internet and the WWW are hot topics on many campuses; indeed, these terms are the current buzzwords of higher education. Delivery of distance education that began with the development of correspondence courses in the late 19th century now utilizes a variety of media to reach and serve many non-traditional students. Furthermore, distance education efforts in all forms have had remarkable success (Moore & Kearsley, 1996; Thomerson & Smith, 1996; Willis, 1994).

The Internet is one of the most explosive communication phenomena of the century. The World Wide Web (WWW) is the underlying application that is contributing to the explosive growth of the Internet. According to Galbreath (1997), Lundin (1998), and Starr (1997), the Internet and its user population are growing rapidly, challenging traditional mediums (e.g., voice network) as a dominant communications technology. Table 1 shows the growth of the Internet and the WWW.

Table 1

The Internet and the WWW Growth

Internet Growth	WWW Growth
1969: 4 hosts on the Internet.	1993: Development of Mosaic (first browser).
1983: about 200 hosts on the Internet.	
1994: about 2 million connected computers and 30 million users.	1994: about 200 Web Sites.
1996: about 10 million connected computers and 100 million users.	1996: about 100,000 Web Sites.
1998: about 15 million connected computers and 150 million users.	1998: about 15,000,000 Web Sites.
2000: about 30 million connected computers and 300 million users.	2000: about 40,000,000 Web Sites.

This growth of the Internet and the WWW is expected to continue in the future, especially if the costs of computer hardware and communication services continue to decline. In addition, many colleges and universities now offer complete degree programs on the Web, which could be another reason for the growing number of Internet users (Galbreath, 1997; Lundin, 1998; and Starr, 1997).

Online learning was beginning to transform educational practice at all levels of school systems. For example, a search of the WWW found in excess of 850 virtual universities listed online (see: <http://206.154.197.130:80/VU/>). Consequently, a benefit from online instruction is the educational development of many people, a process that contributes to life-long learning. The flexibility in time and space afforded by online education delivery formats can address the special needs of many students better than many “traditional” delivery formats (Paist, 1995). Online education has great potential in

extending meaningful, rich, and convenient learning opportunities through activities such as the use of electronic mail (e-mail), bulletin board systems (BBS), computer mediated conferencing (CMC), audiographics or video teleconferencing, remote database access, and the WWW (Kearsley, Lynch & Wizer, 1995; Lauzon, 1992). Finally, the researcher observes that the common element underlying all types of online learning is the use of computer networks, whether it is the global Internet or a local campus Internet. In addition, the Internet and the WWW may cause many changes in people's lives; it is hard to predict how these resources will be used in the future, but the researcher is confident in predicting that this medium will change the way people work, communicate, educate, and conduct business for many years to come.

Definitions

Terms relevant to this study are defined below:

The Internet: The Internet, also called the Net, is a world wide net work of computers through which people can communicate, transport data, and share information with each other. The Internet links millions of computers throughout the world.

The World Wide Web (WWW): WWW, also called the web, is a global information retrieval system that allows people to find and view computer documents, called web pages. These pages contain text, graphics, and hypertext links. A hypertext link is also called a hyperlink, a hotlink, or just link. The link is key word or phrase, usually highlighted in blue (or another color) and underlined. The user mouse-clicks to jump to another web page or to a different part of the same web page. A hyperlink can also be a graphic image.

Online course: A course offered over the Internet, featuring Web pages, and usually utilizing e-mail and chat rooms, with some possible contact over the phone, face to face, fax, or through traditional mail. Generally, an online course is designed using the WWW and using e-mail or file transfer protocol (FTP). Students receive lecture notes and assignments over the Internet, respond with submitting assignments and taking exams on the Internet. Contact with the instructors or peer groups usually takes place via e-mail, chat rooms, electronic bulletin boards, telephone, fax, or regular mail, and it also could occur face to face.

Chat Rooms: Any of several technologies available that allow two or more Internet users to communicate synchronously.

Electronic bulletin board (BB): An electronic BB allows students to communicate asynchronously by placing notices and responses to a web page.

Threaded discussion: A threaded discussion is similar to an electronic BB and features categorical, chronological posting of messages and responses.

News Group: A news group is a special interest group to which users have agreed to subscribe, featuring discussions, postings, and responses centered around a specific topic or area of interest.

Instructor's slide: It is common practice for instructors to post information on a web page in the form of a Power Point presentation, a commercial software application. One unit or frame of the presentation is called a slide.

FTP: File Transfer Protocol is used to move files between Internet sites.

Dummy variable: Dummy variable is a dichotomous variable that is assigned binary values for purpose of computation.

Need for Study

With the continuing growth of online courses, researchers have focused their attention on the issue of program evaluation. The primary motivations for this attention are the need to justify the often-high cost of technology required to implement and maintain these programs, the need to demonstrate that online educational delivery is pedagogically sound, and a need to assess the efficacy of on-line instruction. Indeed, the greatest benefits of online classrooms are derived from pedagogy that most effectively uses the characteristics of the technology to increase the quality of the learning experience (Biner, 1993; Keegan, 1986; McCormack & Jones, 1998).

According to Chen (1997) and Cheung (1998), an assessment of participant reactions to a program should precede any assessment of learning outcomes. Students' perceptions are one of the important inputs for evaluating the quality of learning achieved. Positive student reactions to online classes, of course, cannot be construed as a guarantee that learning has taken place. On the other hand, negative reactions can both undermine support for the program and detrimentally affect learning. Thus, a systematic evaluation effort should start with the assessment of student attitudes and opinions. Once these assessments have been analyzed, changes can be made to rectify the factors of the program that produce negative reactions.

The evaluation process is fundamental to achieving quality control in distance education. It facilitates the identification of possible flaws in the instructional system and guides the changes needed to improve distance education programs. The lack of quality control in distance and traditional systems is one of the shortcomings of the educational process. So, to avoid this problem, it is necessary to have an ongoing evaluation system

for distance education courses. Data gathered through student and teacher questionnaires can be analyzed to identify course strengths and weaknesses, as well as technical problems encountered by participants. These data can be used to improve the quality of distance courses and programs from their inception (Lane, 1989; Magalhaes & Schiel, 1997).

Online course evaluation is essential for continual enhancement of the quality of distance teaching. It is particularly important for distance education because of spatial and temporal separation of teacher from student, which may result in a mismatch between their respective expectations. According to Cheung (1998), to evaluate the teaching effectiveness of online courses, the end-of-course student ratings remain the primary source of summative evaluations in most distance education settings.

This research is designed to assess community college students' perceptions and attitudes toward online courses. In accord with Cheung (1998), the researcher believes that students' perceptions and attitudes toward online courses are particularly useful for many purposes. These purposes may serve: (1) to provide faculty and staff with diagnostic feedback for improving the academic quality of the course (i.e., to revise the learning objectives of a particular course, to improve the mode of delivery, and/or to make adjustments of learning materials); (2) to provide information for personnel and administrative decision making (i.e., tutor's contract renewal, allocation of resources); (3) to allow students to express their needs and views formally and systematically; (4) to advance research on distance teaching methodologies and curriculum development; (5) to monitor the quality of distance teaching for the sake of accountability; (6) to collect information for accreditation team visits and members of the board; (7) to provide

comparative data across different courses so as to monitor the consistency of standards; and (8) to facilitate staff development (i.e., to provide tutors with feedback for improving their performance, to assist the course team in planning workshops for refining tutors' teaching skills).

Delimitations, Limitations, and Assumptions

This study was delimited to community colleges in State of Colorado, specifically to five Colorado community colleges that are members of the Colorado Community College Online (CCC Online) system.

This study was limited to those who agreed to participate, and who responded to the survey from the five colleges that were willing to participate in this study. The five colleges chosen for the sample had higher numbers of students taking online courses than ones not chosen. In addition to the five colleges, some respondents identified themselves as members of a group called "CCC Online students," as if they were not affiliated as much with a specific college, but affiliated with the CCC Online consortium in general. Thus, CCC online students are identified as a sixth, independent system. According to information the researcher received from the vice president office for CCC Online colleges consortium for the year 1998, the largest five online courses enrollments were: (1) Community College of Aurora; (2) Community College of Denver; (3) Front Range Community College; (4) Red Rocks Community College; and (5) Pikes Peak Community College. Data collection was constrained to adhere to procedures required by participating colleges, and is fully described in the Methods chapter.

This study assumed that administrators forwarded the survey via e-mail to all online instructors, that instructors forwarded the survey via e-mail to all students, and that

administrators and instructors were diligent in collecting feedback from students and relaying it to the researcher.

Significance of Study

Student input influences curriculum design (McCutcheon, 1988) and, therefore, can contribute to the design and implementation of school reform measures. In turn, students' input can contribute to the design and implementation of effective online courses that respond to learner needs and increase motivation, interest, and career awareness. Curriculum design issues are complex, and student perspectives can provide valuable input into effective curriculum design process. Thus, learners can serve as sources of information about the value and relevance of online courses. Since most distance education programs are highly dependent on educational technologies, educators need to determine the attitudes of the respondents toward the use of educational technologies both for teaching and for learning.

The current literature suggests a relationship between student perceptions about the courses in which they are enrolled and student viewpoints about the relevance of those courses to future employment or career prospects (Duttweiler & Shirley, 1993; Moskal, Martin & Foshee, 1997; Oakes, 1992). This study was designed to assist distance educators in improving courses through developing a tool (survey) to identify student perceptions about online courses. In accord with Cheung (1998), Moskal, Martin & Foshee (1997), the researcher believes that such an attempt at developing a quality evaluation is necessary in order to improve current distance instruction, and to plan for expansion of distance education and the use of new technology. In addition, this study might be considered as a guide for community colleges offering online courses, and for

administrators, staff, and students, with the goal of developing and improving online courses. According to Anderson (1997) and Heath (1997), limited empirical information is available that describes the components of an effective distance education program, particularly an online offering. Rather, a large amount of anecdotal information about distance education practice exists. The researcher hopes that this study might contribute to a growing base of empirical information and knowledge that will serve to develop and improve online courses.

Purpose Statement

A review of distance education literature identified key components of effective distance education programs, including student achievement, student satisfaction with the class, teaching methods, interaction, and communication (Fullford & Zhang, 1993; Martin & Rainey, 1993; McDonald & Gibson, 1998; Ritchie & Newby, 1989; Wick, 1997). This review of literature led the researcher to believe that an appropriate course of study was to investigate the perceptions and attitudes of community college students regarding online courses. The purposes of the study were to describe student perceptions and attitudes toward online courses overall and in six sub-areas (1) course structure; (2) student-teacher interaction; (3) teaching content; (4) student-student interaction; (5) college staff assistance; and (6) general satisfaction. In addition, there was an interest in determining if there were differences in mean scores of student perceptions toward online courses based on gender, ethnicity, age, and other demographic variables.

Research Objectives

The objectives of this study were as follows:

1. To build a base of demographic data about the Colorado community college students taking online courses such as gender, ethnicity, age, number of online courses taken, work hours, college system, and family status.
2. To build a base of data regarding students' evaluations of and opinions about online courses.
3. To determine if there are significant differences between students' perceptions of online courses between or among the levels of demographic variables.

Research Questions and the Null Hypotheses

The study answered the following questions:

1. Are there differences in mean scores of students' perceptions overall toward online courses among respondent groups for each of the following seven areas:
 - a. course structure
 - b. student-teacher interaction
 - c. teaching content
 - d. student-student interaction
 - e. college staff assistance
 - f. general satisfaction
 - g. overall
2. Is there a difference in overall satisfaction with online courses by gender?
(Ho: The overall satisfaction with online courses (dependent variable) does not depend on gender.)

3. **Is there a difference in overall satisfaction with online courses by ethnicity?**
(Ho: The overall satisfaction with online courses (dependent variable) does not depend on ethnicity.)
4. **Is there a difference in overall satisfaction with online courses by age?**
(Ho: The overall satisfaction with online courses (dependent variable) does not depend on age.)
5. **Is there a difference in overall satisfaction with online courses by the number of online courses a student is taking?**
(Ho: The overall satisfaction with online courses (dependent variable) does not depend on the number of online courses a student is taking.)
6. **Is there a difference in overall satisfaction with online courses by work hours (full time or part-time job)?**
(Ho: The overall satisfaction with online courses (dependent variable) does not depend on gender the number of work hours.)
7. **Is there a difference in overall satisfaction with online courses between student who had children (age 0-5 years) living at home and those who did not?**
(Ho: There is no difference in overall satisfaction with online courses between student who had children (age 0-5 years) living at home and those who did not.)

CHAPTER II

REVIEW OF LITERATURE

In this chapter, the researcher divides the literature relating to methods of distance education delivery into two parts: computer technology delivery methods, and other delivery methods.

Computer Technology Delivery Methods

This part summarizes studies relating to the use of computer technologies, including the Internet or Web-based courses, computer conferences, and computer based distance education.

Studies Relating to the Internet or Web-based Courses Used in Distance Education

Saunders (1998) conducted a study designed to describe and understand the meaning of responses of study participants to interactive computer-mediated communication within a distance learning environment. The study setting was a distance learning graduate course taught in an on-campus studio classroom at Ball State University and transmitted via the METS Network to five distant sites in Indiana. An interactive Internet site, the Course Homepage and adjacent links, was an important instructional component of the course. It was developed to enable and support active, collaborative learning among distance learners. The participants were 13 studio students and 24 off site students; all graduate students enrolled in degree programs. One professor

and two graduate assistants delivered course and Web site instruction. The responses of participants were collected through a series of surveys and interviews during the sixteen-week semester. Evidence collected focused on learner responses to the computer component of this distance learning setting. The intent was to identify the cognitive and affective learning strategies developed and employed by students to effectively learn in the educational environment of computer-mediated distance education. Two cognitive learning strategies identified were the management of the computer environment and the management of personal resources. Two affective learning strategies identified were the management of self and the management of others. The computer medium of this setting played an important role in determining how students responded to, and learned within, this distance learning environment. The development of the cognitive and affective learning strategies was influenced by the instructional design of the distance course and the Course Homepage. In the recommendations, the researcher focused on implications for future distance education design and development. One essential recommendation was the need for a clear model of distance learner participation and further research requirements in areas such as learner characteristics, applications of interactive media, and course design issues.

Another relevant study (Yang, 1998) involved the design of a Web-based undergraduate C programming course, examination of the feasibility of using the Web to deliver classroom activity, and the implementation of a formative evaluation to this Web-based course. The participants in this study were students at the University of Nebraska-Lincoln enrolled Spring and Summer session, 1996-1997; 27 students took the course in the Spring, and 10 students in the Summer; another 10 students participated in the course

but were not enrolled for credit. The web-based course attempted to simulate classroom activities, and included a tutorial system, discussion board, question-response forum, a reference Web site, and a survey form. The course was written in HTML, Java Script and CGI, amounting to approximately seven- thousand lines for the eight-weeks of instruction. The results from the evaluation survey showed a strong positive influence in learning C programming from the using of Web-based course. The researcher recommended that further inquiry should focus on the relationship between the design of a Web-based, virtual classroom model and its overall effectiveness.

Baxter (1997) completed a study; the purpose of that was to measure faculty perceptions of accessibility and quality of college graduate programs offered via the Internet. This study attempted to determine whether faculty who were teaching graduate courses delivered via Internet perceived those courses to be of high quality, and to what degree such offerings provided additional accessibility to graduate students not able to participate in direct instruction in a traditional classroom. This study utilized the snowballing technique to produce a nationally gathered sample of college faculty who taught graduate courses using the Internet as the primary delivery medium. The participants were 64 instructors who were surveyed electronically to determine their perceptions of quality and accessibility of graduate education delivered via Internet. The researcher analyzed the data with a one-way ANOVA to determine whether significant differences existed among perceptions of faculty toward access and quality based on perceived environmental characteristic preference, which included teaching/learning culture, course/program administration, instructional quality, learner involvement, and course delivery. In addition, the researcher used the Kruskal-Wallis analysis of variance

test to determine whether differences existed between tenure status and the faculty's perceptions of quality and accessibility of graduate courses offered via Internet. The results show that there were no perceived differences among any of the environmental factors regarding quality or accessibility of graduate programs offered via the Internet. Further, there were no perceived differences between tenured and non-tenured faculty in either quality or accessibility. However, a majority of those faculty members responding to the survey were in agreement that graduate courses offered via the Internet were of good quality and generally made graduate education more accessible.

Heflich (1997) investigated the attitudes and practices of educators who are participants in online educational discussion groups. The researcher mentioned that constructivist teaching has become a dominant theme in educational literature in response to the positivist model of education that is prevalent in schools. It is generally acknowledged that in order for K-12 education to become more constructivistic there must be a qualitative change in teaching practice from more didactic to self-directed student learning. The participants were 25 teachers from two different groups of schools: those who work in an environment in which the use of online technology is thoroughly infused in all aspects of the curriculum and those for whom there is little support for the use of online technology in their classroom. Interviews were conducted to determine whether those as an integral part of the school curriculum are more likely to exhibit the attitudes and behaviors of constructivist teachers than those who do not use online technology regularly. Two findings emerged from the study: (1) a movement toward constructivist teaching and learning is enhanced by access to online computer technology, where access is defined as both the availability of online technology in the classroom and

the absence of restrictions on its use by students and teachers; and (2) a positive school climate is needed in order for a high degree of access to online technology to be obtained. Finally, this study suggested that teachers need to be encouraged to become more committed to individualized instruction and small group work, both of which are elements of self-directed student learning.

The purpose of Porter's study (1997) was to describe the level of use of the Internet by The Ohio State University (OSU) Extension educators. The study also investigated the relationships between the level of use of Internet and selected factors such as computer literacy and proficiency, Internet home access, and Internet literacy. The researcher used a descriptive-correlation research design for this study. A questionnaire was developed and mailed to 207 Extension educators within the state of Ohio. The data showed that 94 percent of the Extension educators have Internet access at work; 47 percent of the educators had access at home; and Extension educators were a little or somewhat proficient with the skills needed to use the Internet and most of them were proficient at e-mail with somewhat positive perceptions of the Internet. Data, also, showed substantially significant associations among home access, computer literacy and proficiency, and Internet literacy. Very strong associations existed for Internet proficiency and perception of the Internet that persuade others within extension to use the Internet. Finally, the researcher recommended that Extension educators need to be given more information and training on the use of the Internet; training in-services need to be top priority; Extension educators using the Internet should be rewarded; and educators need to develop proficiencies using distance education technologies.

Strong and Harmon (1997), in their study, reviewed and compared three offerings of graduate degrees via the Internet; two master's programs in the field of management and one master's program in the area of library and information science. Three different management degrees offered by the University of Phoenix, the Master of Arts in Management offered by the Graduate School of America, and the Master of Science in Library and Information Science offered by the University of Illinois at Urban-Champaign were described according to each program's online and printed prospectus. Based on this information, the three programs are compared and evaluated. The study concludes with a "Consumer's Guide" that formulates some key questions that any potential student of these types of programs should ask before enrolling in such a program. The study importance was to represent a first step in an attempt to inform the educational "consumer" of some online graduate degree offerings as well as some important questions that should be considered in any evaluation of them.

Townley's (1997) study attempted to establish a baseline of information about instructors and students taking advantages of the Internet as a delivery method for community college course work. The study examined perceptions of students and instructors of the effectiveness of the Internet education and the technical issues involved in construction, development, and delivery of Internet courses. The researcher mentioned that instructors had relatively high computer and technical skills. Most courses being taught over the Internet were constructed with some type of interactive communication tool, and the courses required a substantial amount of writing. The instructors believed that teaching Internet courses was very satisfying and that they were very likely to teach another Internet course in the future. There were no significant differences between

responses of males and females. In addition, the students were interested in taking another Internet course in the future. The researcher concluded his study with recommendations such as: (1) establish a review board at each community college offering Internet courses to ensure consistent quality; (2) establish a template of some very well-designed Internet courses that would be posted on the Internet and be accessible to anyone interested in Internet course development; (3) use an Internet discussion group to establish a forum for the analysis and exchange of ideas regarding the proctoring the exams and assignments that are delivered and taken over the Internet; and (4) establish training modules intended to teach potential Internet instructors the fundamentals of online instruction.

Liu (1996) completed a study to examine a graduate level general chemistry course delivered on the Internet. A qualitative case study procedure was used for this research. The central question explored was “What did the students and instructor experience in the course?” The themes emerging from an in-depth understanding of the complexities of the participants’ experiences were elaborated and the implications of the new teaching approach as an alternative in the curriculum and instruction design were discussed. The major themes included merits and limitations of distance learning and technology-mediated learning as well as the implications of cooperative learning in distance education. The findings demonstrated an overall positive evaluation of the Internet chemistry course in terms of providing otherwise unattainable educational service, creating a highly collaborative teaching and learning environment, and meeting various needs of in-service chemistry teachers. The participants thought highly of using CD-ROM Small Scale as the course textbook and of the instantaneous class interactions.

The participants encountered difficulties that were associated with this learning mode such as difficult e-mail access, shortage of hardware and software, lack of technical training support, and pedagogical issues such as attitude toward distance education, time management, and class participation management.

Kearsly, Lynch, and Wizer (1995) explained that Wizer and Lynch examined student beliefs and attitudes about the benefits and limitations of online courses in the Master degree program in Educational Technology Leadership (ETL) at George Washington University. They administered a questionnaire to two ETL classes. The ETL program began operating a simple Bulletin Board System (BBS) to promote interaction between on-and off-campus students in different class sections. The questionnaire contained 13 belief statements using a 5-point Likert scale, 3 attitude questions using a 10-point Likert scale, and 4 open ended response questions. With a total of 117 students completing the survey, the main findings with respect to beliefs were: (1) over 97 percent of the students agree that the BBS enhanced the television presentations and gave students an opportunity to communicate with other students, (2) 82.2 percent of the students believed that BBS helped students assume the role of the teacher themselves, (3) 83.3 percent of the students believed that BBS provided an authentic learning environment, and (4) 54.3 percent found the BBS to be helpful in improving writing skills. The results of the attitude portion of the questionnaire indicated that 73 percent of the students agreed the BBS improved interaction among students. In the open ended questions, there were a number of major themes expressed by students. The most commonly mentioned benefit was the power of online communication for sharing ideas and experiences with fellow students and faculty. Respondents emphasized the value of

the assistance provided by classmates in the context of class projects as well as solving real workplace problems. Students also cited the power of working in small groups on projects using the BBS. The most commonly mentioned limitation was the frustration associated with the use of telecommunications hardware and software to access the BBS. Finally, the results of this study on the benefits and limitations of BBS use in the ETL program suggest that students find that the use of online learning enhances communication and learning in our classes, although they dislike the complexities associated with telecommunications hardware/software. Respondents consistently stated that they learned a great deal from their peers while using the BBS, suggesting the authentic nature of the online learning process. The results also indicate there are differences in their comfort with, and use of, the BBS over time.

Studies Relating to Computer Conferences Used in Distance Education

The purpose of McCabe's (1997) research was to help teachers, researchers, and theorists understand the unique challenges and opportunities of computer conference classrooms. Case studies were constructed to document the curriculum designs, the teaching practices employed, and the online interaction that occurred in each course. Data sources included course transcripts, interviews with the teachers and students, student surveys, and online observations. Data analyses of the transcripts relied upon a coding system that emerged inductively from participants' descriptions of their experience. The findings are presented first as three case reports which provide an overview of each course, followed by a detailed cross-case analysis which compares the courses' curriculum designs, the teaching strategies employed, and the patterns of participation. The central finding of this study was that computer conferencing can

support a range of learning environments, from a traditional teacher-led symposium to a participatory writer' workshop model. In two of the three courses studied, there was a high level of interaction and satisfaction among the participants. However, participation patterns across the courses showed that a few students dominated the majority of online discussion. The sparse interaction in the third course made visible the potential pitfalls of communication that can occur. The data suggest that teachers' frequent participation and explicitness about their expectations are essential factors to a healthy online discussion. These findings call into question some of the benefits hailed in the literature on computer conferencing, namely that it promotes equal participation and a democratic learning environment. Finally, the uneven participation in all three courses suggests that a horizontal response level is not a given function of the medium, despite the equal access provided.

Murphy, Cifuentes, Yakimovicz, Segur, Mohoney, and Kodali (1996) conducted research using a qualitative method with six researchers collaborating in data collection, analysis, and development of meaning. This study, which took place during a fifteen-week semester at Texas A&M University in late 1994, involved seventy-seven students studying educational technology. The study presents an analysis of six semester-long computer conferences moderated by university students to discover how students perceived and used the conferences. The two purposes of conferences were to provide a meaningful, authentic context for teachers to learn about technology and collaborative learning, and to provide an opportunity for graduate students to learn to moderate computer conferences in an authentic context. A qualitative analysis of the conference data yielded the following findings (1) student-moderator roles reflect the influence of

both instruction and personal communications styles, and (2) participants adopted behaviors that fostered communication in a text-based environment and led to positive attitudes about computer conferencing. In summary, the findings describe the role of the moderator and of the participants in student-moderated computer conferences. The moderator role, which incorporates organizational, social, intellectual, and technical functions, is influenced by both the course instruction and personal communication styles. The participant role illustrates the adoption of behaviors that foster effective communication and an accompanying growth in positive attitudes toward computer conferences.

Gunawardena (1992) reflected on three variables: his experiences, change, and growth as a distance teacher in two settings (1) in a graduate course taught at a distance using audiographics conferencing and computer-mediated communication, and (2) in an online distance learning experience introduced into a traditional (face-to-face) class in which graduate students in several universities were linked to participate in computer discussion on distance education and telecommunication. The discussion of these experiences explores and analyzes the unique skills needed for distance teaching in each situation; the significant challenges, rewards, and frustrations; the quality of the learning experiences; the ways in which distance teaching differs from teaching in a traditional classroom; and the impact distance teaching has had on the author teaching beliefs, practice, and professional growth. The biggest frustration has been the lack of recognition for the amount of time and effort that goes into planning and teaching a distance class. This article outlined the unique skills distance teachers must develop in order to provide effective distance learning experiences. A sound faculty development

program is necessary to help faculty assume their new roles and responsibilities.

Institutional support and adequate support system for distance teaching, coupled with opportunities for professional development, are essential to sustaining faculty motivation and recruiting new faculty to the distance teaching enterprise.

Studies Relating to Computer Used in Distance Education

Nasseh's study (1997) investigated the computer and communication skills of teachers who have taught computer-based distance education classes and of the students who registered in computer-based distance education in the fall semester, 1996, in higher education institutions in Indiana. The researcher developed two questionnaires, one for faculty members and the other for students. Both instruments elicited responses about technical skills in computer and communication tools and applications, training and support programs, motivation and objectives of participants, concerns about computer-based distance education, and advantages of this method of education. Analyses of faculty data revealed that nearly all the faculty were competent in the use of computers for communication and in accessing resources via such tools. The majority of the faculty responded that they had competence in designing computer educational applications, but also had many concerns such as student/teacher communication and lack of personal interaction among students in computer-based distance education. The faculty saw many advantages such as new opportunities for adult education and the teacher's role as facilitator in computer-based distance education. Analyses of student data revealed that the majority of students had adequate skills in e-mail, File Transfer Protocol, and WWW. The students had concerns about training and support programs in higher education institutions in Indiana, teacher/student communication, training program by university,

and connection costs. Students also saw many advantages such as flexibility of time and place and variety of learning resources in computer-based distance education. In general, the results of this study indicated that higher education institutions should design faculty development programs beyond technical skills to include instructional design.

Furthermore, a practical training program based on need assessment and off-hours support programs are essential for the success of computer-based distance education programs and for positive educational experience for teachers and students. Finally, the researcher recommended that there are tremendous needs for research in computer-based distance education in areas such as computer and communication skills of teacher and student, student objectives for participation, effectiveness of training and support programs, effectiveness of instructional design, educational experience of teachers and students, the teacher's role, and subjects and contents which are feasible online.

Kennedy (1996) did a study to explore and portray the computer mediated communication (CMC) experience of distance graduate students, faculty and staff in the pilot offering of a course entitled Foundations of Program Evaluation at Memorial University of Newfoundland during the Fall semester of 1995. This was a new graduate course at Memorial University and, for the first time in their graduate distance education program, CMC was integrated into the course through the use of e-mail. Participants were required to engage in online small group and class discussions regarding assigned readings throughout a six-week period. Additionally, students were encouraged to communicate with fellow participants, faculty and staff via e-mail. Data were gathered through semi-structured interviews of all participants, an attitude survey administered via e-mail and the regular post, and through a content analysis of all course e-mail forwarded

voluntarily to the researcher throughout the study by all participants. Participants included the seventeen students, the professor and two on-site coordinators (staff). All respondents but one student indicated that they enjoyed the experience and considered it successful and most worthwhile. The researcher recommended future applications of e-mail in graduate distance education.

Other Delivery Methods

This part summarizes studies that were done using other delivery methods, such as interactive television, satellite, and general studies discussed different issues about distance education.

Studies Relating to Interactive Television Used in Distance Education

Isman (1998) designed a study to examine students' perceptions of distance education and to compare their perceptions based on age, gender, educational level, instructional site, number of distance education courses taken, academic major, being full-time or part-time student, and content taught. The researcher in this study followed two approaches to collect the data: quantitative and qualitative. In the quantitative section, data was collected from 210 Ohio University undergraduate and graduate students taking Higher Education Microwave Services (HEMS) courses. A 39-item Likert scale questionnaire was used for collecting the data in the quantitative section. In the qualitative section, data were collected from 23 students who joined interview sessions, and additional information was recorded from the observations of 64 additional classes. The results show that there was no relationship between students' perceptions based on gender; no relationship between students' attitudes and their age, no relation between student attitudes and their year in school. There was a strong relationship

between student perceptions and the delivery method, indicating that students preferred two-way interactive television classes to other distance delivery methods. Weaker relationships were found between sites, major, and status and students' perceptions. The results of interviews related that most of the students agreed that most ineffective part of their interactive television class involved technical problems, many of which were audio problems. All observation data about course satisfaction supported the results of the interviews and the findings from quantitative data. The level of student satisfaction in the class was not high. Finally, the researcher's suggestions for future research include investigations regarding teachers' perception, comparison of students' perception and their grades, and a combination of quantitative and qualitative analysis for content taught.

Mottet (1998) examined the relationships between interactive television instructors' perceptions of student's nonverbal responsiveness and their perceptions of distance students, teaching effectiveness, teaching satisfaction, teacher-student interpersonal relationships, and their preference to teach in the interactive television classroom versus the traditional face-to-face classroom. The sample included 157 instructors who taught in both the traditional face-to-face and interactive television classrooms. Two identical surveys were mailed to each participant; one was to be completed considering students in the traditional face-to-face classroom and the other in the interactive television classroom. The surveys contained measures of student nonverbal responsiveness, student impressions, teaching effectiveness, teaching satisfaction, teacher-student interpersonal relationships, and selective preference of teaching venue. The study's seven questions all examined relationships between the variables and mean differences between instructional contexts. The researcher, from the

data analyses, derives three general conclusions: (1) Interactive television instructors' perceptions of students' nonverbal responsiveness are positively related to their perceptions of student impressions, teaching effectiveness, teaching satisfaction, teacher-student interpersonal relationships, and their preferring to teach in the interactive television classroom, (2) Instructors' perceptions and evaluations of students' nonverbal responsiveness, teaching effectiveness, teaching satisfaction, teacher-student interpersonal relationships, and selective preference of teaching venue are higher in the traditional face-to-face classroom than the interactive television classroom, and (3) receiving both visual and audible nonverbal cues from distance learners via two-way audio/video versus two-way audio/one-way video delivery systems enhance perceptions of nonverbal responsiveness in addition to perceptions of student impressions, teaching effectiveness, teaching satisfaction, and teacher-student interpersonal relationships.

Rueschman (1998) completed a study, the purpose of which was to examine Northern Arizona University students' perceptions and attitudes of experiences encountered in distance education and distance learning utilizing two distance learning delivery systems, Interactive Instructional Television and Computer/Modem technologies. The researcher used in this study a multi-method design, qualitative and quantitative, and utilized a survey instrument and interview to collect the data. The survey instrument for the Interactive Instructional Television contained 46 Likert scale items and the Interactive Television Interview contained 30-open ended questions. The survey instrument used for the Computer/Modem contained 45 items Likert scale type and the Computer/Modem Interview contained 31 open-ended questions. The items in the two survey for the Interactive Instructional Television and Computer/Modem were

grouped into six clusters: student perceptions and attitudes using Interactive Instructional Television technology and Computer/Modem technology; instruction and Instructor characteristics; course management and coordination; physical environment characteristics; Interactive Instructional Television/Computer/Modem courses and Traditional classrooms; the advantages and disadvantages of interactive Instructional Television and Computer/Modem Courses. The instrument was mailed to a random sample of 323 Interactive Instructional Television students and a census of 187 Computer/Modem students. A survey interview was taken using 25 randomly chosen students who participated in the Interactive Instructional Television courses and 25 randomly chosen students who participated in the Computer/Modem courses. The results for this study indicated that there were no practical significant differences between student perceptions and attitudes using Interactive Instructional Television or Computer/Modem in regard to the research questions.

Sherry, Fulford, and Zhang (1998) did evaluation studies conducted on two different measures of distance learners' satisfaction with instruction. These two approaches were investigated to offer distance educators a choice between two measures: (1) a brief written survey on key aspects of interaction focused on interactional instances in the distance education classroom. These choices were based on Moore's (1989) framework for studying learner-to-instructor, learner-to-learner, and learner-to-content interaction in distance education. The survey was developed for investigating key aspects of the first two interactional constructs; and (2) a more time-intensive, facilitated interview conducted to obtain in-depth measure of the instructional climate. The measure investigated is the Small Group Instructional Diagnosis (SGID), a widely focused

measure used to obtain a global and detailed view of the instructional climate. It employs a trained facilitator who interview students mid-semester about multidimensional factors related to teaching effectiveness. The two separate evaluation studies were designed to answer the following questions: (1) Can quantitative data on distant learners' perceptions of overall and specific interactional instances be obtained efficiently in a reliable manner on a brief, written instrument-an interaction survey? (2) Do distant and traditional learners and educators, participating in a formal, facilitated, mid-semester, interactive evaluation process-the SGID-view the process as an effective, interactive one? These two studies of student-based evaluation processes were designed to assess and report on the interaction survey and the SGID, summarizing results in terms of the four main categories of accuracy, utility, feasibility, and propriety.

Study One:

A study of the psychometric quality of the interaction survey-a quantitative measure of interaction- was initiated with eighty-four distance learners enrolled in three credit-bearing classes. The classes were delivered by an interactive televised system at the University of Hawaii at Manoa. The delivery system uses microwave and ITFS technologies to provide four channels of video and audio for the Hawaiian Islands. Sixty-one of the distance learners were participants at origination sites, and twenty-three were located at four remote sites. The interaction survey examined in this study has a fourteen item Likert scale type ranging from 1 (strongly disagree) to 7 (strongly agree). Those items were employed in assessing students' perceptions of the overall level of interaction, the level of interaction between the instructor and the class, and the level of interaction among the students. Responses were gathered from all sites during the

beginning of the semester (n= 84) and a gain at latter part of the semester (n=77). The internal consistency for the survey, if the fourteen item surveys were used to measure the unitary concept of perceived overall interaction, was 0.85. The reliabilities generally fell within an acceptable range and indicated satisfactory stability of the survey over time. The results of this study suggest that the interaction survey have a fairly distinct, stable, and adequate two-factor structure largely congruent with Moores' general framework of interaction in the distance education classroom. The survey has potential for efficiently and reliably obtaining student perceptions of the "interaction climate" in interactive television education. Instructors may consider using the survey at different points of time for formative or summative evaluation of student perceptions of interaction. Researchers recommended that further research is needed to explore the effect of distance education exposure on student perceptions of various components of interaction in the interactive television classroom, because future research along this line may unlock the mystery of what makes students feel connected or not connected in the interactive television classroom.

Study Two:

This study was a qualitative, interactive, formative evaluation approach, Small Group Instructional Diagnosis (SGID), in which a facilitator gathers data about instructional environments from students to enhance their interactional climate at mid-semester. The facilitator, during the instructor's absence from one class meeting, guides students through three questions about what helps, hinders, and should be changed regarding learning in their class. All comments are subsequently reported and displayed for whole class consideration. Through voting, a ranked list of factors emerge which the

facilitator reviews with the instructor. Subsequently, the instructor discusses the report and any planned changes with the class.

The effectiveness of this evaluation process was examined in both traditional and distance education classrooms to illuminate its use in both settings and highlight any particular features of the process in the later setting through an examination of any particular features of the process in the later setting through an examination of any contents between settings that might emerge. The evaluation study placed particular emphasis on examining the utility and feasibility of the SGID in distance education. Participants included 39 distance education graduate students, 29 traditionally taught graduate students, 45 traditionally taught undergraduate students, and eight educators. To control for possible effects of facilitators' personality, class size, and academic field; classes were selected on the basis of having the same SGID facilitator, being from similar academic fields, and being medium sized. The four groups of students meeting the criteria included two sets of graduate-level education majors and two sets of undergraduates in the social sciences. The graduate student groups were comprised of students concurrently enrolled in two education courses delivered by two-way video and audio and graduate students in a traditionally delivered education course. The undergraduate students were enrolled in two sections of traditionally delivered courses in allied fields. An open-ended, three question survey was constructed based on the familiar structure of questions employed during the mid-semester evaluation.

At the conclusion of the courses, participants were asked three questions about the SGID: What helped the evaluation process? What made the evaluation process difficult? And, what recommendations do you have for changes to the SGID? Students and

instructors in the traditional classes responded through written forms distributed in class and e-mail employed with the distance education participants.

The results of this study suggest that its potential as a course evaluation tool for both gathering evaluative data about the learning environment and supporting interaction through the evaluation itself. The overall satisfaction of the distance education participants with the SGID for measuring the instructional climate indicates its potential for providing timely, formative feedback on distance courses. Finally, results indicate the effectiveness of both approaches for assessing aspects of the instructional climate in the distance education classroom. Both measures are offered to encourage future researchers to study them separately and together with other populations so greater insight may be obtained on their potential for providing appropriate, complimentary, qualitative, and quantitative evaluation data from diverse distance learners' perspectives.

Westbrook (1997) examined attitudinal changes in graduate business students during the first term of a two-year degree program taught via a fully interactive telecommunications system (interactive television). The variables included the students' interaction levels, satisfaction levels, and perceptions of technological interference. The participants were fifty-four adult part-time students enrolled in one or two graduate business courses that originated on the Drake University campus during the fall term of 1994 and were received at three remote sites in Iowa. Site differences in the students' pre-program and post term scores, and changes in the students' anticipated to actual attitudinal levels were observed. The results support the importance of ongoing assessments of the students enrolled in distance education credit classes and degree programs. In addition, the findings suggest that (1) students attitudes change between the

time they begin classes and complete their first term, and (2) there are site differences between the students enrolled on campus, where the instructors are present and students are at remote locations.

Biner, Summers, Dean, Bink, Anderson, and Gelder (1996) investigated student satisfaction with interactive telecourses as a function of demographic variables and prior telecourse experience. The primary goal of this study was to extend the research linking the role of student demographics and prior telecourse experience as predictors of achievement in telecourses, to the potential role of these variables in predicting student attitudes about such courses. Specifically, the researchers were interested in determining the extent to which the age, gender, socioeconomic status, personal income, and prior telecourse experience of students enrolled in televised college-level courses were predictive of satisfaction with facts of those televised courses. The researchers in this study used the Telecourse Evaluation Questionnaire (TEQ), a telecourse attitudinal assessment instrument with sound psychometric properties. The TEQ was specifically designed to assess student satisfaction with a variety of aspects of interactive telecourses; it simply lists various facets of telecourses, and asks students to rate each of its 33 items on a five-point Likert-type scale. TEQ survey items generally fall into one of three statistically determined factors, i.e. items assessing student satisfaction with: (1) instructor/instructional, (2) technical, and (3) logistic/management aspects of interactive telecourses. There were 699-participants in this study, graduate and undergraduate students enrolled in 33 telecourses at a large Midwestern university in the United States during the 1993-94 and 1994-95 academic years. Class sessions were broadcast live (one-way video, two-way audio) from one of two on-campus studio

classrooms to 122 remote sites across the state. The 33 courses spanned a wide range of content areas: four accounting courses, one astronomy course, one Biology course, two psychology courses, three education courses, two English courses, one finance course, two history courses, six management courses, one marketing course, five nursing courses, and one philosophy course. The results of this study showed that: (1) female students were significantly less satisfied with the logistic/management facets of their telecourses relative to male students, (2) the students with the most telecourse experience expressed the least positive attitudes about instruction/instructor aspects of the courses. Finally, the researchers recommended further research on the antecedents and consequences of telecourse student satisfaction.

Fulford and Zhang (1993), in their study, examined learner perceptions of interaction and satisfaction in a course delivered by interactive television. The participants were 123 K-6 teachers in Development Approaches in Science and Health program. The three-session course showed significant correlations between perceptions of personal and overall interaction within the class. Perceptions of personal interaction were a moderate predictor of satisfaction. The critical predictor of satisfaction was the perception of overall interaction. These findings suggest that when learners perceive the level of interaction to be high, they will be more satisfied with instruction than when they perceive the level of interaction to be low. Vicarious interaction within the class as a whole may result in greater learner satisfaction than will the overt engagement of each participant. However, both perceived levels of interaction and satisfaction appear to decline with increased exposure to interactive instructional television. The findings of this study have important implications for the design of distance education courses and

programs. Overall interaction dynamics may have a stronger impact on learners' satisfaction than strictly personal participation.

Studies Relating to Satellite Used in Distance Education

Martin and Rainey (1993), in their study, investigated the effect of satellite-delivered instruction on student achievement and attitude in a high school anatomy and physiology course in Alabama. The experimental group included students from seven high schools enrolled in the satellite-delivered course. The control group consisted of students from seven high schools in which classroom teachers provided instruction. An experimental versus control matched-pair design was used in this study. Two hypotheses were tested using the t-test for dependent samples. The findings show that there was no significant difference between the experimental group and control group in attitude toward anatomy and physiology. However, on the achievement test, the mean post-test score of the experimental group was significantly higher than that of the control group. Also, the results suggest that distance delivery can be effective for teaching a high school science course. Students enrolled in the satellite-delivered anatomy and physiology course scored significantly higher than students did in a traditional classroom setting. The findings also show that the attitudes of students receiving distance instruction were not significantly different from attitudes of students receiving traditional classroom instruction.

Studies Discussed Different Issues in Distance Education

The purpose of the Paneitz (1997) study was to determine the perceptions of distance education students in two-year institutions toward advising, counseling, and library/media services. The study's objectives were designed to provide information to

assist community college personnel in the development of relevant student support services for distance-education students. The researcher developed two questionnaires for this study. The purpose the first questionnaire was to determine how advising, counseling, and library/media services were being provided, and it was sent to 59 two-year colleges. The second questionnaire requested information regarding students' utilization and satisfaction with the student services being provided. A total of 183 student questionnaires from 9 institutions were returned. The data collected from this study indicated that two-year institutions providing degree programs via distance education used delivery systems for academic advising, counseling, and library/media services ranging from no-technology systems in which students had to come to campus, to high-technology systems, in which students could access the services through various technologies. The type of delivery systems used to provide those services did not significantly impact the utilization by students. Additionally, for the most part, the type of delivery system did not affect the level of satisfaction of students with the services. Age and ethnicity were not significant factors in either the degree of utilization or the level of satisfaction with the services. Only in rare instances was gender of the students a significant factor in the degree of utilization or the level of satisfaction with services. Finally, the results shows that academic advising was found to be the most essential student service for distance students; access to library/media services was second; and counseling was found to be the least essential service.

Moskal, Martin, and Foshee (1997), in their study, mentioned that the Faculty Development Group of the Central Florida Consortium of Higher Education (CFCHE) developed a needs assessment to address the capabilities and experience of CFCHE

faculty with distance education, educational technologies, and instructional design. Assessment results include 1) the factor perceived by instructors as most important for both promoting and inhibiting the learning of new educational technologies; 2) distance education experience with and interest in various delivery approaches; and 3) the extent to which CFCHE faculty possess the necessary instructional design skills to initiate distance education courses. These results may provide information that is beneficial to institutions planning distance education initiatives. The completed need assessment, five-point Likert-type, consisted of three primary categories: factors influencing the use of educational technologies, distance education experience, and the importance of educational technologies and instructional design. Approximately 2,000 surveys were sent to CFCHE faculty members; 271 surveys were completed. The results of this study show that the majority of the faculty members were inexperienced in designing and teaching courses via distance education technologies. Most of the instructors were interested in learning about the real time, interactive delivery technologies. Furthermore, this study identified three factors that promote faculty willingness to adopt the use of educational technologies (1) the educational technology must improve student learning, (2) it must offer a clear advantage over traditional delivery approaches, and (3) the required equipment must be available to use in the classroom. In addition, approximately two-thirds of the respondents believed that educational technologies are very important both for improving student learning and improving teaching.

Wick' study (1997) compared foreign language distance learning at remote sites versus on-site locations. The researcher examined problems that exist in distance learning. The participants in this study were 76 distance learning students who

participated in classes surveyed in seven northeast metropolitan Twin Cities high schools, plus 20 interviewed students. The study used six predictor variables: site, pre-achievement test, pre-attitude towards distance learning, pre-attitude towards teaching methods, pre-expectation of class events, and pre-attitude towards interaction and communication, in addition to four criterion variables: post-achievement test, post-satisfaction with class, post-satisfaction with teaching methods, and post-satisfaction with interaction and communication, to determine which six predictor variables had a significant impact on the criterion variables. The researcher developed 17 questions from survey results, which served as the basis for the interviews. The analysis of the data indicated no significant mean score differences in final achievement between students at on-site and remote locations. There were significant differences in student attitudes between sites. On-site students stated that distance learning classes are more interesting than traditional classes and remote site students said they would rather take traditional classes, and remote site students said they would rather take traditional classes. The researcher concluded his study in two major primary conclusions: (1) students in remote settings depend upon an enhanced use of traditional discussion, questions and answer and participation with other students to feel a sense of connection to the teacher and the class; and (2) students expect the medium to be used in ways which will take advantage of its special visual and auditory capabilities. Finally, the researcher recommended that future research include investigation of teacher training concerning the effective use of technology.

Ritchie and Newby (1989) examined the influence of the environment in which instruction was delivered on the frequency and type of interactions on student performance and student attitude. A comparison was drawn between the interaction possible in a traditional face-to face classroom, a studio classroom, and in a distance classroom equipped with two-way audio situations. Twenty-six college undergraduates participated in this study. Each was randomly assigned to one of three treatment groups. The groups consisted of instruction delivered within the following setting (1) traditional classroom in the presence of an instructor, (2) TV broadcast studio classroom in the presence of an instructor (live studio), and (3) studio classroom with television monitors instead of instructor (distance). The results of this study show that the various mediums (face-to-face versus television) were not significant factors on achievement; the traditional group did not differ in achievement from either of the other two groups. Results of perceptions indicate that distance students experience less involvement, less ability to ask questions, and less overall enjoyment.

Summary

To conclude this chapter, it is observed that most of the literature reviewed demonstrates common factors which correspond to the purpose of this study. These factors include the importance of course structure, human interaction, and student satisfaction. Baxter (1997), Kearsley (1995), Liu (1996), McCabe (1997), Murphy (1996), Nasseh (1997), Saunders (1998), Townley (1997), and Yang (1998) were discussed the significant values for interaction between student and many other learning operation elements. Also, the design of the distance courses, particularly online courses, is considered one of the key aspects that contributes to successful learning in this kind of

environment. Biner, et al. (1996), Moskal, et al. (1997), Mottet (1998), Rueschman (1998), Sherry (1998), Westbrook (1997), and Wick (1997) were identified key interaction aspects such as student-teacher interaction, student-student interaction, and student-content interaction in distance education. Finally, technological interference is the remaining factor that contributes (or detracts from) interaction and satisfaction levels. Most researchers agree that perceptions of students are positively related to their perceptions of teaching effectiveness, teaching satisfaction, teacher-student interpersonal relationships, and teachers' preferences to teach using an online classroom mode.

Many studies, including this one, are concerned about the quality and accessibility of online courses. Such quality and accessibility is assessed in three basic ways: by assessing and describing student perceptions of the quality of instruction; by assessing faculty and staff perceptions of the efficacy of delivery; and by assessing the effects of various uses of technology used for delivery (Heflich, 1997; McCabe, 1997; Murphy, et al. 1996; Sherry, 1998; and Townley, 1997). For example, online course discussion group should be used to establish a forum for the analysis and exchange of ideas regarding exams and assignments; and a course evaluation tool should be used to gather data about improving the learning environment and supporting interaction (note that the evaluation itself provides both data and a forum for interaction). In addition, most of the studies consider the teacher an essential factor in promoting a healthy online discussion. The teacher also is essential to promote equal participation and a democratic learning environment.

It is further recognized that students must have adequate skills for this type of online learning such as writing skills relevant to the use of e-mail, an ability to

manipulate software such as File Transfer Protocol, access to and literacy about the WWW, and access to technical training and support (Liu, 1996; Nasseh, 1997). Online teachers and assistants must also have adequate skills such as the ability to design computer educational applications, skill in managing class participation, time management skills, technical computer skills, and the ability to manipulate communication tools and applications, etc. (Gunawardena, 1992; Nasseh, 1997; Townley, 1997).

Higher education institutions should design faculty development programs beyond technical skills to include instructional design. This practical training program should be based on need assessments to insure the success of computer-based distance education programs and to promote positive educational experiences.

An online course enhances communication and learning, especially student learning, through collaborative interaction with peers. In online learning, the collaborative interactions among students when attempting to complete class projects is an effective methodology; as a matter of fact such collaboration appears to be just as effective as a learning environment in which students attempt to solve real work place problems, face-to-face (Kearsley, 1995). This study is congruent with existing research in recognizing the importance of ongoing assessments of students enrolled in distance education courses, particularly online courses. These assessments should consider a range of influential factors. Two important factors are the students' change of attitude from the beginning of the first class to the completion of the first term, and differences between students receiving instruction on campus, where instructors are present, and students at remote locations. Further, online technology must improve student learning,

improve teaching, and must offer a clear advantage over traditional delivery approaches (Paneitz, 1997; Moskal, et al.1997; Westbrook, 1997).

This research also seeks to determine the extent to which some demographic variables such as gender, ethnicity, age, course subject, etc. may affect the overall perceptions of students toward online courses. This study corresponds to some previous literature (Biner, et al.1996; Isman, 1998; Paneitz, 1997), and contributes to existing knowledge by examining other demographic variables. This study, in conjunction with others, seeks to provide information to assist community college personnel in the development of relevant student support services for online course students.

To summarize the review of literature, the research findings were concurrent in many recommendations. There are tremendous needs for research in computer-based distance education (Nasseh, 1997); educators need to be given more information and training on the use of the Internet (Porter, 1997); future applications of e-mail in graduate distance education should be pursued (Kennedy, 1996); more research is appropriate in the area of comparing students' perceptions and their grades (Isman, 1998); teacher-training should be examined and developed to promote more effective use of technology (Wick, 1997). More broadly, the antecedents and consequences of student satisfaction with online instruction should be examined (Biner, et al.1996). Future research along this line may unlock the mystery of what makes students feel connected or not connected in online courses.

CHAPTER III

METHODS

Population and Sample

The population in this study consisted of students who had taken online course(s) through Colorado Community College Online (CCC Online) courses and/or through one of five Colorado community colleges, the colleges that have the highest online enrollment. All courses are stand-alone online courses, that is, each college or instructor develops and delivers the course independently of other colleges; there is not a standardized delivery protocol among the instructors or colleges in the sample. All courses were conducted during Spring and Summer semesters, 1999.

According to information the researcher received from the vice president office for CCC Online consortium colleges in 1998, CCC Online is composed of the 13 higher community colleges education institutions in the Colorado Community College and Occupational Education System (CCCOES). Through CCC Online, a student can earn a fully accredited Associate of Applied Science Degree in Business, recognized by all the 13 community colleges of the system and completely transferable between the colleges. Students may individualize curricula by choosing courses from any of the participating institutions, according to their preference, schedule, and course availability. Moreover, CCCOES colleges have standing transfer agreements for their business core courses and

general education core courses with most of the four-year public and private colleges in Colorado. In addition, there are transfer agreements with colleges both in-state and out-of-state that offer baccalaureate completion programs. CCCOES was established in 1986 and is considered the largest system of higher education in Colorado, serving more than 217,000 students annually. The thirteen colleges are: (1) Arapaho Community College (ACC); (2) Colorado Electronic Community College (CECC); (3) Community College of Aurora (CCA); (4) Community College of Denver (CCD); (5) Front Range Community College (FRCC); (6) Lamar Community College (LCC); (7) Morgan Community College (MCC); (8) Northeastern Junior College (NJC); (9) Otero Junior College (OJC); (10) Pikes Peak Community College (PPCC); (11) Pueblo Community College (PCC); (12) Red Rocks Community College (RRCC); and (13) Trinidad State Junior College (TSJC).

The five community colleges chosen for this purposive cluster sample were determined by analyzing the Telecommunications Cooperative annual report to determine the institutions with the highest student enrollments in online courses. Having determined which of the 13 colleges had the highest enrollments according to the annual report, the researcher contacted the distance education office at each college by telephone to verify the number of students enrolled in online courses for the current semester. Information regarding the relative size of enrollment gleaned from the telephone calls corresponded with the annual report, indicating that the five colleges targeted were, in fact, among those with the highest enrollment in online courses.

The design of the CCC Online courses generally feature a World Wide Web format utilizing e-mail for one-on-one communication. Online instruction can include sophisticated discussion groups between and among students and instructors and even

visiting scholars from various disciplines. The courses can also feature a great deal of interaction with the instructors, other students, and other people as well as interaction with the course content. In addition, online courses feature Internet chat rooms, threaded discussions, audio, video, weblibliographies (hyperlinks to other Web-based resources), and much more.

According to information the researcher received from the vice president office for CCC Online consortium colleges the differences between the CCC Online courses and the individual college courses vary from college to college depending on what company or software package is providing the “shell” in which the course resides. Some courses simply rely on e-mail and electronic document attachments; others are more sophisticated. For CCC Online, the students are “cohort” groups, so a “class” may include students from any one of the consortium members. By definition, core courses that the colleges offer in the traditional classroom, online through CCC Online, or online at the individual colleges, should “look” similar. That means these courses should have the same course description, credit hours, competency requirements, and result in similar instructional outcomes. However, some of the course requirements, such as homework assignments and/or tests, can vary dramatically from college to college, from program to program, and from instructor to another. In addition, the administrative control of the courses may vary from college to college.

This study targeted the five community colleges that had the highest enrollment of online distance education students. Students were either taking CCC Online courses or stand-alone community college online courses in the Spring of 1999. Student enrollment numbers were determined by analyzing published reports of enrollments, then cross-

checked by calling the distance education offices at selected colleges. After calling the first four colleges determined to have the highest online course enrollments, it was evident that the top two institutions (in enrollment) were Aurora Community College and Front Range Community College. Four telephone respondents verified this fact (Lisa Cheney-Steen, CCA; Greg Smith, CCD; Diane Hegeman, RRCC, Steve Tillson, FRCC). The other three schools included in the study had high current enrollments (greater than 50), although the rankings were not determined. This, too, was verified by the four respondents.

The researcher used three criteria to select the final cluster sample: (1) a minimum of 50 students per college taking online courses; (2) the perception of four community college leaders that the community college programs selected were considered to be among the largest online enrollments; and (3) that the community college had at least nine online course offerings for that semester. The five community colleges selected were Community College of Aurora, Community College of Denver, Front Range Community College, Red Rocks Community College and Pikes Peak Community College. Table 2 displays the number of online course offerings and the number of students enrolled in these courses for each college during the Spring semester, 1999.

Table 2

Description of the Target Population Including the Number of Online Courses and Number of Students Enrolled in During the Spring Semester, 1999

College	Number of online courses	Number of students enrolled in
CCA	45	605
CCD	9	55
FRCC	43	562
RRCC	24	220
PPCC	35	142

Design

This study is a single group, posttest only design, sometimes referred to as a “one shot” design and employs two specific approaches, a descriptive approach and a comparative approach. The research provides a baseline of information about community college level students taking online courses, their perceptions and their attitudes, and compares those responses in consideration of certain demographic variables and attribute variables.

The data for this study were collected through a survey delivered by e-mail. The process of distributing the survey was as follows: the survey was e-mailed to the director of the distance education programs at each institution, along with a cover letter describing the survey and instructions for distribution to students (see Appendices B and C); each college was asked to send an official letter to the Human Research Committee (HRC) at Colorado State University (Celia Walker) stating an understanding of and support for the

survey and indicating concurrence with the HRC policy by the individual institution; the directors then forwarded the survey to individual instructors with instructions to distribute it to their online students (see Appendices A, B, and C); students were instructed to return the completed survey directly to the researcher; in the case that student surveys were returned to the instructor, not the researcher, the instructor was asked to forward the survey to the researcher.

Design of the Survey Instrument

The survey instrument was designed to gather data that would help to give answers for the research questions and help to achieve the research objectives described earlier. Because distance education instruction via online course offerings is a fairly recent phenomenon, there were few previously developed survey instruments that could be used for this study. A review of the literature on the topic began in the Spring of 1998. The researcher also interviewed two instructors at Colorado State University who both had experienced teaching different courses through the university distance education system. The data from the interviews were coded and analyzed by using a qualitative methodology. From the process, three major areas of concern emerged related to online course delivery methods of distance education, course design, and student perceptions of distance education.

A study of student interactions in distance education environments was deemed an appropriate direction of inquiry. Environments for interaction could include student-student interactions, student-teacher interactions, student-staff interactions, and student-support service interactions (e.g., library, technology). In addition collaboration with the director of the Distance Learning Program at the Community College of Aurora, Lisa

Cheney-Steen, resulted in the development of a three-part questionnaire designed to gather data about students' perceptions and attitudes toward online courses. The first and second parts of the questionnaire were self-report items that were designed to obtain demographic data and descriptive information about student perceptions in six areas: (1) course structure; (2) student-teacher interaction; (3) teaching content (course content); (4) student-student interaction; (5) college staff assistance; and (6) general satisfaction. In addition, a third part was added which included an open-ended question to elicit students' feelings and attitudes toward online courses regarding any other issues they deemed important.

The first part of the questionnaire asked students to supply demographic data (gender, ethnicity, age, course name, course number, work status, total number of online courses experienced, having children aged 0-5 years at home or not, and types of communication that were used in these courses). The second part of the questionnaire contained 30 statements covering six areas and responses were quantified using a seven point Likert-type scale: 1= very strongly disagree; 2= strongly disagree; 3= disagree; 4= uncertain; 5= agree; 6= strongly agree; and 7= very strongly agree. The third part of the instrument collected qualitative data from participants that who were willing to respond to an open-ended item regarding general issues relating to online courses (see Appendix C).

The first version of the questionnaire was revised after consultation with nine faculty and staff at Colorado State University and the five community colleges represented in the study (the directors of distance education and online course

instructors). The resulting version of the instrument was judged to have high content validity.

Using Cronbach's alpha for the overall items of the survey and for each of the six sub-areas, the pilot study determined that the internal reliability of the survey items overall was .96 and for the six sub-areas were as follows: (1) course structure; items 1-5, (alpha = .92); (2) student-teacher interaction, items 6-10, (alpha = .94); (3) teaching content, items 11-15, (alpha = .94); (4) student-student interaction, items 16-20, (alpha = .79); (5) college staff assistance, items 21-25, (alpha = .89); and (6) general satisfaction, items 25-30, (alpha = .80).

Data Analyses

In the first and second parts of the questionnaire, the six independent variables in the study were gender, age, ethnicity, work, having children aged 0-5 years at home or not, and number of online courses experienced previously. The seven dependent variables were course structure, student-teacher interaction, teaching content, student-student interaction, college staff assistant, general satisfaction, and an over-all score determined by combining all scores. One way ANOVAs and t-tests were used to determine if differences in the responses to various questions (the dependent variables) were attributable to the independent variables. In the third part of the instrument, the researcher coded the responses and described the data in a narrative report.

Data Gathering Procedure

The researcher did not have any direct of communication with the students or with the instructors. The survey was e-mailed to the administrators at each participating

college during the Spring and Summer semesters, 1999. The researcher requested them to forward it to all online instructors in their colleges.

The researcher assumed that online course instructors received the survey and distributed it to all their students (see Appendix A). The students were requested to complete the surveys on their computers and forward them directly to the researcher (see Appendices B and C). On receipt, the researcher made a buffer (a copy of the survey data omitting student identity) and saved the data electronically and in hard copy.

A second e-mail originating from the instructors was also e-mailed to all subjects one week after the survey was posted, encouraging students to respond. Students also had the option of printing the survey form and mailing or faxing it to the researcher. In such cases, the researcher offered to reimburse subjects for mailing costs or to provide a pre-addressed, stamped envelope on request. All data were collected following approval of the research project by the HRC at CSU (see Appendix D).

CHAPTER IV

FINDINGS

One of the primary purposes of this study was to describe and assess community college students' perceptions and attitudes toward online courses. The data and information gathered serve as a baseline of knowledge for (1) instructors who are teaching online courses, (2) college administrators who are adopting online courses in their programs, (3) students who are registering in online courses, and (4) others who are interested in online courses.

Students from CCA, FRCC, and CCC Online responded to the survey using e-mail (see Appendix C); but three different community college systems (CCD, RRCC, and PPCC) did not show any responses. The data set does not inform the researcher why three colleges responded and three did not.

The number of completed surveys received was 87 during the Spring semester, 1999. This small number of responses required the researcher to e-mail the survey again in the Summer semester 1999, following the same procedures used previously. The researcher attributes the low return rate of surveys in the first data gathering attempt to be due to the fact that the request for responses was late in the Spring semester, close to the final exam period. Several college administrators concurred and suggested a second attempt be made during the Summer session. This second attempt resulted in the receipt

of and additional 51 completed surveys. Total surveys included in the data set were 138. The completed number of responses is not large compared to the target population size, but serves the purposes of this study.

Subjects Demographic Data

In keeping with the intent of this research, the first portion of the research involved the establishment of a baseline of demographic information about community college students taking online courses. The analysis of the data revealed the following findings. All online courses in this study were above the academic 100-level and were considered transferable courses, which means that these courses may be used toward a degree at the same college or different college. More female (69 percent) than male (31 percent) students were represented. Because a majority of the students were white (85 percent), the researcher dealt with ethnicity as a dichotomous dummy variable (white and not white). Most of the students' ages were greater than twenty-five years old (77 percent); the rest (23 percent) were less than or equal to twenty-five years old. For analysis purposes, students were divided into two groups, those who took one or two online courses, and those who took three or more online courses. Fifty-seven percent of the students fell into the one or two courses group (that is, had taken one or two online courses at any time), and the remaining 43 percent had taken at least three or more online courses. The majority of the participants were working full-time (83 percent); while 17 percent were working part-time. The data also showed that about 51 percent of the participants reported that they had children (aged 0-5 years old). The largest percent of participants (49 percent) was enrolled at Front Range Community College. Table 3 summarizes subjects' characteristics as well as other demographic data.

Table 3

Demographics and Related Characteristics of Community College Students Enrolled in Online Courses (N=138)

Characteristics	Number	Percentage
Gender		
Male	43	31
Female	95	69
Ethnicity		
White	117	85
Others	21	15
Age		
25 years old and up	106	77
Less than 25 years old	32	23
Number of Online Courses Taken		
Two Courses or less	78	57
Three Courses or More	60	43
Work Status		
Full-time Job	115	83
Part-time Job	23	17
Family Status		
Having a Children (1 – 5 years old)	70	51
Didn't Have	68	49
Responses According to the College System Attendance		
Front Range Community College	67	49
Community College of Aurora	52	38
CCC Online	19	13

One question in this section related to the kind of student-teacher and student-student communication used in the online course (question 10, part I). Responses

showed that all of the participants used e-mail to communicate with their instructors, and 47 percent of them used Electronic Bulletin Boards as another type of communication with their instructors. Thirty-two percent of the students used e-mail to communicate with other classmates. Table 4 summarizes student-instructor and student-student communication.

Table 4

Types and Percentage of Communication Used Between Student-Instructor and Student-Student in Online Courses (N=138)

Type of Communication	% Used with Teacher	% Used with Student
E-mail	100	32
Electronic Bulletin Boards	47	32
Threaded Discussion	26	16
Chat Rooms	16	11
Regular Mail	16	0
News Group	5	5
Instructor Slide	5	0
Face to Face	5	0

Students Perceptions

The data (see Table 5) revealed positive perceptions by students toward the value of online courses in which they were enrolled. On a 7-point Likert scale, students were likely to agree with the positive statements related to perceptions of online courses. Although mean responses to items did vary, roughly, from “agree” to “very strongly agree,” the highest mean ratings were associated with statements related to “I would take

another online course” (M=6.34). The lowest mean rating (disagreement) related to the statement, “The workload required for this course was too much.” (M=3.36).

Table 5

Descriptive Statistics for Each Item of the Second Part of the Questionnaire (N=138)

Item #	Item Statement	Rank Order*	Mean	Standard Deviation
1.	Course objectives were made clear at the outset.	5	5.96	1.57
2.	The course homepage was well edited, presented and produced.	12	5.71	1.66
3.	The selected readings were interesting.	19	5.39	1.41
4.	The amount of assignments was appropriate.	17	5.54	1.42
5.	The course objectives were met.	4	5.96	1.57
6.	The instructor communicated the criteria by which my assignments were to be graded.	3	6.02	1.35
7.	The instructor provided meaningful feedback on assignments and questions.	13	5.68	1.56
8.	The assessment methods (e.g., exams, exercises, assignments, etc.) were fair and reasonable.	7	5.89	1.40
9.	The instructor encouraged me to remain on-task by the use of a variety of strategies.	15	5.64	1.46
10.	The instructor was essential to effective learning in this course.	21	5.26	1.41
11.	The instructor demonstrated knowledge of the subject matter.	6	5.91	1.60
12.	The instructor provided additional information when asked.	8	5.89	1.57
13.	The instructor was enthusiastic about teaching this course.	14	5.65	1.63

Table 5

Descriptive Statistics for Each Item of the Second Part of the Questionnaire (continued)

Item #	Item Statement	Rank Order*	Mean	Standard Deviation
14.	The instructor created situations that made course topics applicable.	16	5.62	1.37
15.	The instructor emphasized key concepts and important elements in the course.	11	5.76	1.51
16.	My learning was enhanced by contact with other students.	27	4.07	1.53
17.	Help received from other students was very important.	29	3.79	1.55
18.	Students were cooperative in working with me.	24	4.58	1.47
19.	Interacting with other students made for a more pleasant learning experience.	28	3.95	1.50
20.	The technology used in this course helped me improve my communications skills.	20	5.35	1.56
21.	The college admission forms were easy to complete.	18	5.54	1.73
22.	The college admissions personnel were helpful.	23	5.07	1.98
23.	The course registration was easily accomplished.	10	5.77	1.71
24.	I received assistance from college advisers for this course.	25	4.48	1.41
25.	I received assistance from college library staff for this course.	26	4.38	1.37
26.	The technology used for this course enabled me to learn the content of the course.	9	5.88	1.40
27.	I would take another online course.	1	6.34	1.69
28.	I feel I learned more than I would have in a traditional classroom based.	22	5.17	1.70

Table 5

Descriptive Statistics for Each Item of the Second Part of the Questionnaire (continued)

Item #	Item Statement	Rank Order*	Mean	Standard Deviation
29.	This online course provided encouragement to continue my education.	2	6.04	1.52
30.	The workload required for this course was too much**.	30	3.36	1.94

*Rank order with respect to the mean.

**Item #30 recode (1→7, 2→6, 3→5, 4→4, 5→3, 6→2, 7→1).

The data also revealed positive perceptions in six areas: course structure items (1-5), student-teacher interaction items (6-10), teaching content items (11-15), student-student interaction items (16-20), college staff assistance items (21-25), and general satisfaction with online course items (26-30), where item number 30 recode. Overall, the participants in this study had positive feelings about the value of online courses in which they were enrolled. Table 6 summarizes the mean scores of students' perceptions and the standard deviation for each of the six areas; in addition to the overall items on the questionnaire.

Table 6

Descriptive Statistics for Each Area of the Second Part of the Questionnaire and for the Overall Items by Site and by Aggregate (N=138)

Areas	Mean	Standard Deviation
	CCA /FRCC/CCCO/Overall	CCA /FRCC/CCCO/Overall
Course Structure	5.99 / 5.63 / 5.26 / 5.71	1.04 / 1.37 / 1.72 / 1.33
Student-Teacher Interaction	5.89 / 5.67 / 5.27 / 5.70	.54 / 1.56 / 1.76 / 1.31
Teaching Content	5.97 / 5.72 / 5.39 / 5.77	1.06 / 1.56 / 1.84 / 1.44
Student-Student Interaction	4.07 / 4.54 / 4.41 / 4.35	1.09 / 1.15 / .47 / 1.08
College Staff Assistance	5.58 / 4.67 / 4.93 / 5.05	.98 / 1.19 / 1.46 / 1.27
General Satisfaction	5.85 / 5.15 / 4.73 / 5.36	.69 / .86 / 1.05 / .92
Overall	5.56 / 5.23 / 5.00 / 5.32	.75 / 1.09 / 1.35 / 1.03

Means of the responses to the questions regarding “Overall” perceptions were compared to the means of the demographic independent variables, using t-tests (see Tables 8-13). The three college systems were compared using a one-way ANOVA to determine if there were any significant differences in “Overall” perceptions. Table 7 shows the results of the ANOVA.

Table 7

ANOVA for Testing Differences in Students' Perceptions of "Overall" Mean among the Three College Systems

Area		SS	df	MS	F	Sig.
Course Structure	Between Groups	8.25	2	4.13	2.39	.095
	Within Groups	232.94	135	1.73		
	Total	241.19	137			
Student-Teacher Interaction	Between Groups	5.43	2	2.72	1.59	.208
	Within Groups	230.99	135	1.71		
	Total	236.42	137			
Teaching Content	Between Groups	4.99	2	2.49	1.20	.304
	Within Groups	279.83	135	2.07		
	Total	284.82	137			
Student-Student Interaction	Between Groups	6.75	2	3.38	2.99	.054
	Within Groups	152.40	135	1.23		
	Total	159.14	137			
College Staff Assistance	Between Groups	24.68	2	12.34	9.19	.000*
	Within Groups	181.28	135	1.34		
	Total	205.96	137			
General Satisfaction	Between Groups	23.20	2	11.60	16.67	.000*
	Within Groups	93.95	135	.70		
	Total	117.16	137			
Overall	Between Groups	5.46	2	2.73	2.64	.075
	Within Groups	139.60	135	1.03		
	Total	145.06	137			

* $p < .05$.

Table 7 shows that F statistics were significant only in student perceptions in two areas: college staff assistance and general satisfaction. There were differences from school to school in how students felt about these two areas. Tukey HSD post hoc tests show that the mean of responses from students toward college staff assistance area at CCA ($M=5.58$) is statistically different at the .05 level of significance from FRCC

(M=4.67) and CCC Online (M=4.92). This means CCA online course students reported significantly higher scores than FRCC and CCC Online students regarding college staff assistance. Tukey HSD tests also show that students' perceptions toward the general satisfaction area at CCA (M=5.85) is statistically different at the .05 level of significance from FRCC (M=5.15) and CCC Online (M=4.72). This means CCA online course students reported higher scores than CCC Online and FRCC online course students in the general satisfaction area. But, in both areas, Tukey HSD tests did not show any statistically significant differences between students' perceptions at CCC Online and FRCC toward online courses.

The other six questions for this study looked for differences between students' perceptions toward online courses and certain demographic data: gender, ethnicity, age, number of online courses taking, work, and family status. The researcher used the t-test to determine if there were any statistically significant differences. Each of these independent variables was divided into two levels (see Table 3).

Question two looked at the relationship between gender and overall perceptions of online courses. The overall area rating of males (Mean = 4.85) and females (Mean = 5.54) was significantly different ($p < .05$). There were statistical significant differences between the overall satisfaction of males and females in their perceptions toward online courses; females reported greater (Overall) scores than did males. Table 8 shows the t-test results.

Table 8

T-test for Gender (Independent Variable) Mean Scores of Students' Perceptions of Online Courses in Seven Areas

Area	Gender				t
	Male (N= 43)		Female (N=95)		
	Mean	SD	Mean	SD	
Course Structure	5.22	1.46	5.94	1.20	-3.01*
Student-Teacher Interaction	5.05	1.64	5.99	1.02	-3.48*
Teaching Content	5.22	1.69	6.02	1.25	-3.08*
Student-Student Interaction	3.81	.82	4.59	1.10	-4.18*
College Staff Assistance	4.57	1.26	5.26	1.15	-3.06*
General Satisfaction	5.24	1.18	5.41	.78	- .85
Overall	4.85	1.15	5.54	.90	-3.45*

* $p < .05$; $t(136, .05) = 1.96$ is the critical value.

Note: significance level for t-test based on equal variance model except when variances are significantly different. For these comparisons, significance level based on unequal variance model. For each equal variance model t-test, $df = 136$. Unequal variance t-test use adjusted df .

Question three looked at the relationship between ethnicity and overall perceptions of online courses. There was one main ethnic group in the sample, white (N= 117), and there were small numbers in other groups. Therefore, the researcher grouped the responses as “white” and “non-white,” resulting in dichotomous data with non-white ethnicity being considered a dummy variable. The difference in the overall area rating of white ethnicity (Mean = 5.35) and non-white (Mean = 5.16) was not statistically significant ($p < .05$). There were no differences between those of white ethnicity and others in their perceptions towards online courses. Table 9 shows the results of the t-tests.

Table 9

T-test for Ethnicity (Independent Variable) Mean Scores of Students' Perceptions of the Online Courses in Seven Areas

Area	Ethnicity				t
	White(N= 117)		Others(N=21)		
	Mean	SD	Mean	SD	
Course Structure	5.76	1.30	5.46	1.48	.88
Student-Teacher Interaction	5.72	1.29	5.60	1.49	.34
Teaching Content	5.80	1.40	5.59	1.66	.55
Student-Student Interaction	4.40	1.10	4.07	.93	1.46
College Staff Assistance	5.08	1.23	4.87	1.24	.73
General Satisfaction	5.35	.89	5.38	1.11	-.11
Overall	5.35	1.01	5.16	1.14	.72

* $P < .05$; $t(136, .05)=1.96$ is the critical value.

Note: significance level for t-test based on equal variance model except when variances are significantly different. For these comparisons, significance level based on unequal variance model. For each equal variance model t-test, $df=136$. Unequal variance t-test use adjusted df .

Question four looked at the relationship between age of the subjects and overall perceptions of online courses. The researcher divided the subjects in two groups of age: the first group was composed of individuals less than or equal to 25-years old and the second group of individuals over 25-years old. The overall rating of the younger age group (Mean = 4.93) and older age group (Mean = 5.44) showed a statistically significant difference ($p < .05$). There were statistical differences between older group and younger group in their perceptions towards online courses; older students reported significantly higher scores. Table 10 shows the results of the t-test.

Table 10

T-test for Age (Independent Variable) Mean Scores of Students' Perceptions of the Online Courses in Seven Areas

Area	Age				t
	<= 25 years old (N= 32)		>25 years old (N=106)		
	Mean	SD	Mean	SD	
Course Structure	5.19	1.68	5.87	1.17	-2.14*
Student-Teacher Interaction	5.23	1.94	5.84	1.03	-1.71
Teaching Content	5.31	2.03	5.91	1.19	-1.60
Student-Student Interaction	4.07	.79	4.43	1.14	-1.68
College Staff Assistance	4.71	1.38	5.15	1.16	-1.66
General Satisfaction	5.06	1.28	5.45	.77	-1.61
Overall	4.93	1.33	5.44	.89	-2.05*

*P < .05; t (136, .05)=1.96 is the critical value.

Note: significance level for t-test based on equal variance model except when variances are significantly different. For these comparisons, significance level based on unequal variance model. For each equal variance model t-test, df =136. Unequal variance t-test use adjusted df.

Question five looked at the relationship between the number of online courses taken by subjects and overall area perceptions of online courses. The researcher divided the subjects in two groups: the first group consisted of subjects who are currently taking an online course and have taken one other, either previously or concurrently, and the second group who have had experience in more than two online courses. one or two online courses” and the second group consisted of “subjects taking three or more online courses”. The overall area rating of the first group (Mean = 5.29) and second group (Mean = 5.37) did not show a statistically significant difference (p< .05). The numbers of online courses taken were not associated with differences between groups in their perceptions towards online courses. Table 11 shows the results of the t-tests.

Table 11

T-test for Number of Online Courses (Independent Variable) Mean Scores of Students' Perceptions of the Online Courses in Seven Areas

Area	Number of online courses				t
	<u><= 2 courses (N= 78)</u>		<u>> 2 courses (N=60)</u>		
	Mean	SD	Mean	SD	
Course Structure	5.78	1.29	5.63	1.38	.63
Student-Teacher Interaction	5.68	1.12	5.72	1.54	- .16
Teaching Content	5.64	1.32	5.94	1.59	-1.21
Student-Student Interaction	4.38	1.31	4.30	.66	.42
College Staff Assistance	4.90	1.43	5.24	.88	-1.69
General Satisfaction	5.33	.87	5.39	.99	- .36
Overall	5.29	1.03	5.37	1.03	- .47

* $P < .05$; $t(136, .05)=1.96$ is the critical value.

Note: significance level for t-test based on equal variance model except when variances are significantly different. For these comparisons, significance level based on unequal variance model. For each equal variance model t-test, $df = 136$. Unequal variance t-test use adjusted df .

Question six looked at the relationship between work hours and overall perceptions of online courses. The researcher divided the subjects in two groups: the first group of subjects worked at full time jobs (at least 40-hours a week) and the second group worked at part-time jobs (less than 40-hours a week). The overall rating of the first group (Mean = 5.27) and second group (Mean = 5.61) did not show a statistically significant difference ($p < .05$). Employment was not associated with differences between groups in their perceptions toward online courses. Table 12 shows the results of the t-test.

Table 12

T-test for Work (Independent Variable) Mean Scores of Students' Perceptions of the Online Courses in Seven Areas

Area	Work		Part time (N=13)		t
	Full time (N= 115)	SD	Mean	SD	
Course Structure	5.62	1.38	6.21	.86	-1.98*
Student-Teacher Interaction	5.62	1.33	6.12	1.16	-1.70
Teaching Content	5.68	1.48	6.20	1.13	-1.58
Student-Student Interaction	4.32	1.00	4.50	1.42	- .72
College Staff Assistance	5.07	1.14	4.92	1.62	.43
General Satisfaction	5.29	.95	5.70	.72	-1.99*
Overall	5.27	1.03	5.61	1.02	-1.47

* $p < .05$; $t(136, .05)=1.96$ is the critical value.

Note: significance level for t-test based on equal variance model except when variances are significantly different. For these comparisons, significance level based on unequal variance model. For each equal variance model t-test, $df=136$. Unequal variance t-test use adjusted df .

Question seven looked at the relationship between family status and overall perceptions of online courses. The researcher divided the subjects in two groups: the first group of subjects reported having children ages 0-5 years and the second group did not have children ages 0-5 years at home. The overall area rating of the first group (Mean = 5.70) and second group (Mean = 4.93) showed a statistically significant difference ($p < .05$). There were differences between the first group and the second group in their perceptions towards online courses. The subject's family status may affect the overall perceptions of subjects toward online courses; those with children report higher scores. Table 13 shows the results of the t-test.

Table 13

T-test for Having Children (Independent Variable) Mean Scores of Students' Perceptions of the Online Courses in Seven Areas

Area	Children(ages 0-5 years old)				t
	Yes (N= 70)		No (N=68)		
	Mean	SD	Mean	SD	
Course Structure	6.00	1.00	5.42	1.55	2.60*
Student-Teacher Interaction	6.17	.67	5.21	1.61	4.56*
Teaching Content	6.20	1.01	5.32	1.67	3.74*
Student-Student Interaction	4.78	1.19	3.91	.72	5.21*
College Staff Assistance	5.53	1.01	4.55	1.24	5.06*
General Satisfaction	5.53	.66	5.18	1.11	2.25*
Overall	5.70	.75	4.93	1.13	4.70*

* $P < .05$; $t(136, .05)=1.96$ is the critical value.

Note: significance level for t-test based on equal variance model except when variances are significantly different. For these comparisons, significance level based on unequal variance model. For each equal variance model t-test, $df=136$. Unequal variance t-test use adjusted df .

Students Attitudes or Part III of the Survey

This part of the instrument collected qualitative data from the subjects who responded to open-ended question regarding any general issues relating to online courses. In this part of the survey, subjects had the opportunity to explain their attitudes toward online courses. Thirty-two responses were tabulated and some respondents only supplied answers for one part of the question, not all parts of the question. The responses are summarized in Table 14.

Table 14

Summarization of the Subjects' Responses and the Frequencies (F) to Part III of the Survey (N=32)

Open-ended Question	Common Responses	F
1. List three things you liked about this course.	a. Flexibility (time/place); convenient	32
	b. E-mail as a communication type	32
	c. Instructor (attitude, knowledge, manner, cooperation, etc.)	21
	d. Homepage; group chats	19
	e. Interaction from the bulletin board	16
	f. Resources were helpful (e.g.: textbook)	14
	g. Course content	12
	h. Absence of hassle	10
	i. Individualization of learning	8
2. List three recommendations to improve this course.	a. Several meetings with instructor during the semester.	13
	b. Interacting with classmates must be mandatory	11
	c. Instructions and assignments must be clear and easy to follow	9
	d. More chat rooms are necessary	8
	e. Extra learning with reward	6
	f. More mandatory projects could have been assigned	6
	g. Motivate students to do more reading and discussions	5
	h. Don't let people mess with accounts	5
	i. Extra credit assignments	4
	j. Assignments has to be more applicable	4
	k. More examples of different types of documents available	3
	l. Entire course available from the start	3
	m. Go at your own pace	2
n. Website improvement	2	
o. Make tests more flexible (independent questions)	2	
3. Feel free to add any additional comments about your experience or feelings regarding online courses.	a. Interaction level is different between colleges	10
	b. Reading and tests were heavy and hard	8
	c. Course content is too much for one semester	7
	d. Threaded discussions must be mandatory	6
	e. Website was hard to use	3
	f. Buying textbooks or shipping was a nightmare	2
	g. Smaller textbooks and more online content	2

CHAPTER V
SUMMARY & DISCUSSION

Summary

Online learning activities are becoming a common component of post-secondary education. They have now become a central aspect of many college level courses and even entire degree programs. The common element underlying all types of online learning is the use of a computer network, whether it is local campus connections or the global Internet. The Internet has become a hot topic of conversation and the subject of much attention in education and the news media. Only a few years ago there was little education being delivered over the Internet. But now with its global reach extending into individuals' homes and offices on demand, the Internet has paved the way for true "anywhere/anytime" education. The open-ended responses in this study confirmed that more students in this sample are choosing online learning for reasons of availability and flexibility.

It did not take long for some college instructors to take advantage of the Internet and begin offering online courses utilizing this new technology. But the problem was there were few safeguards and standards to insure the quality and integrity of the courses being offered. Even more fundamentally, there was a dearth of base line of research on the use of the Internet as a teaching tool (Townley, 1997).

The purpose of this study was to establish evaluative data about students taking online courses (N=138) from Colorado Community Colleges Online (CCC Online) students. This study contributed to growing a baseline of information and knowledge that may serve to improve delivery quality and to develop improved evaluation of online courses. The first section of the research established a demographic profile of students taking online courses. The second section explored students' perceptions toward online courses. Finally, the third section of this study dealt with students' attitudes toward online courses.

Research Objectives

The objectives of this study were as follows:

1. To build a base of demographic data about the Colorado community college students taking online courses such as gender, ethnicity, age, number of online courses taken, work hours, college system, and family status.
2. To build a base of data regarding students' evaluations of and opinions about online courses.
3. To determine if there are significant differences between students' perceptions of online courses between or among the levels of the demographic variables.

Procedures

In spite of the recent advent of online technology as a viable means of distance education, a review of literature revealed not much research about online courses. But there is a substantial amount of research that has been done about the effectiveness of other types of distance education delivery methods.

This study was descriptive in nature and required the use of a questionnaire for collecting data from community college students taking online courses. The researcher, through review of the literature on the subject and through personal interviews, developed the questionnaire with distance education instructors.

The questionnaire was sent via e-mail to students taking online courses during the Spring and Summer 1999 semesters at five local community colleges to include CCC Online students too, a distance education option offered cooperatively by Colorado community colleges. A total of 138 completed surveys were received during the Spring and Summer 1999 semesters. The survey was used to collect evaluative data about online courses and demographic data about the participants. Frequency counts and percentages were used to establish the demographic profile of the participants. One way ANOVA's and the t-tests were run to determine if there were significant differences between students' perceptions toward online courses between or among the levels of each of the demographic variables.

Results

Following is a summary of the statistical analysis of the data gathered by the instrument used in this study and a discussion of the results.

Students Demographics

In the limited amount of research that has been conducted to discover demographic descriptions of students who enroll in online courses, it is clear that there are only a few details that have been revealed. In this study, the students taking online courses were comprised of 69 percent females and 31 percent males. This preponderance of females engaged in online courses is the opposite of what one might expect, since

Internet users in general are estimated to be 75-85 percent male (Quarterman, 1996). The proportion of female online students is almost as unbalanced as that of the Internet users as a whole (Townley, 1997).

The results show that the age group with the largest representation (77 percent) was more than twenty-five years old. The average age of Internet users in general is approximately 33 (Quarterman, 1996), and the average age of community college students nationwide is 32 (Phillippe, 1996). The age range for online course students in this study falls within parameters one might expect.

All the participants in this study reported working at least part-time. Such a high number of working students is not unexpected since the profile of all college students seem to be changing as economic necessity forces increasing numbers of students to hold at least part-time jobs while attending school (Townley, 1997). The availability of online courses allows a large number of students to take college courses when their schedules would not ordinarily allow them to enroll in courses delivered via traditional classroom instruction. Online learning could be a viable option for many people who can't go to campus and want to continue making progress in a degree or certificate program, upgrade skills, fulfill job training and development goals, or seek educational opportunities for personal reasons. Students in the study were generally pursuing educational goals in their spare time: 57 percent are taking only one or two online courses, 51 percent have small children at home (aged 0-5 years), and 49 percent attend Front Range Community College (not unexpected because FRCC has the largest number of participants in the target population for this study).

The data also show that the majority of the students (85 percent) in this study were white. One may question whether or not there is a similar ethnic profile among students in Colorado community colleges in general.

Students Perceptions

The data show positive perceptions by students toward the value of online courses. The students' perceptions mean rating overall for online courses, in general, was 5.32 on a 7-point Likert scale. However, students strongly agreed with positive statements about the value of online courses.

The data also revealed positive perceptions by students toward online courses in the six areas that Part II of the survey dealt with: course structure, student-teacher interaction, teaching content, student-student interaction, college staff assistance, and general satisfaction (see Table 6). The students' perceptions tend to be positive for each area, indicating that students liked their online course experiences. These results, in general, agree with Fullford and Zhang (1993), Kennedy (1996), Mottet (1998), Murphy, et al. (1996), Porter (1997), Townley (1997), and Yang (1998).

Therefore the researcher concludes that online courses have the potential to be a successful, positive experience for students, especially given that the results of this study show that most of, if not all of, the participants were interested in taking another online course in the future. These positive perceptions can be an important source of input for evaluating online course quality, but cannot be construed as a guarantee that learning will take place.

One-way ANOVA's show statistical differences at .05 significant level in the results of this study in two areas: college staff assistance and general satisfaction. These

differences may be caused by individual differences. Tukey HSD tests show that students' perceptions rate means toward online courses at Community College of Aurora were higher than Front Range Community College (FRCC) and CCC Online students in both areas college staff assistance and general satisfaction. These differences in the means were statistically different at the .05 level of significance. The Tukey HSD did not show any statistical differences at the .05 level of significance between FRCC and CCC Online in these areas.

Female students' perceptions were more positive than male students' perceptions of online courses in the following areas: (1) course structure, (2) student-teacher interaction, (3) teaching content, (4) student-student interaction, (5) college staff assistance, and (6) in the overall satisfaction area. Therefore, the null hypothesis was rejected at .05 level of significance. This runs contrary to the findings of Isman (1998) and Townley (1997) who independently concluded that there was no relationship between gender and students' perceptions of web-based and computer-based learning.

The null hypothesis was supported in one area only, "general satisfaction," which means that male students' perceptions were not statistically significant different (at the .05 level) than female students' perceptions of online courses in the general satisfaction area. This counters the findings of Paneitz (1997), who concluded that gender was a significant factor in the degree of utilization or level of satisfaction with services.

Students more than 25 years of age had more positive perceptions of online courses than younger students in two areas: course structure and "overall" (all items combined). The null hypothesis in both areas was rejected at the .05 level of significance. But the null hypotheses were not rejected in the other areas. Parts of these

results agree with Isman's (1998) results, which found no relationship between students' attitudes and their age. This is also consistent with Paneitz' (1997) results, which found that age was not a significant factor in the level of satisfaction with services.

The researcher believes that this heightened level of satisfaction with online courses may be due to the unique features of online distance education: it is more flexible than classroom-based instruction, especially in terms of time economy and scheduling; and more convenient, in terms of where learning activities occurred (in most cases at home).

The data in this study show that two independent variables, ethnicity and number of online courses being taken, have no effect on students' perceptions of online courses in all areas. Therefore the null hypotheses were not rejected (at the .05 level of significance). This concurs with the findings of Paneitz (1997), who concluded that ethnicity was not significant factor in the level of satisfaction with the service, and with Biner, et al. (1996), who concluded that students with the most telecourse experience expressed the least positive attitudes about instruction. The researcher was not sure if the students rated the survey items considering only their present experience or whether they included past experiences with this type of learning.

Students' working full-time reported significantly ($p < .05$) higher levels of satisfaction than those working part-time in two areas, course structure and general satisfaction. Therefore, the null hypotheses in both areas were rejected. On the other hand, there were no statistically significant differences at the .05 level of significance between these groups in the other areas. The researcher concludes that students working part-time may have more time for learning than students working full-time. This

observation supports a previous conclusion that economy of time is an important benefit of online learning for these subjects.

The results also revealed that students with children (aged 0-5 years) were more satisfied with online courses than those without children ($p < .05$ level). Therefore, the null hypotheses were rejected. The researcher believes that students with young children were more satisfied with online learning because online learning offers more flexibility in time and convenience than more traditional classroom learning. Further research in this area will be recommended.

Other Findings

Two important issues emerged from the third part of the survey (see Appendix C), the qualitative portion of the inquiry, which addresses the importance of student-student and instructor-student interaction in online course structure, and the degree to which online learning supports continuing education efforts.

1. Online learning and interaction

A common criticism of distance education, in general, is the supposed lack of interaction between instructors and students (Townley, 1997). Even with the utilization of electronic communication, online learning has not been immune to this criticism. Students responded to the questions concerning student-teacher interaction, however, very positively. The results indicated that students very strongly agreed that there were enough interactions between students and their instructors.

The researcher believes that sharing ideas and experiences with a peer group increases the power and value of online learning. Overall interaction dynamics may have a strong effect on learners' satisfaction with instruction. Community colleges must be

able to find ways to increase levels of student-student interaction and student-teacher interaction which may increase students' learning and students' satisfaction.

2. Online learning and continuing education

The results of this study indicate that students strongly agree that online courses provided encouragement for them to continue their education. This is a positive sign for this type of distance education (online learning). Students report taking courses for a variety of reasons: to obtain a degree or certification; upgrade skills as a job requirement; and/or other personal reasons. Because students report a willingness to take another online course, the researcher believes that the demand for online learning will continue to grow.

Conclusions

Based on the findings of this study, the following conclusions were made:

- 1. All online course students sampled had the ability to use e-mail to communicate either with their instructors or with their classmates.**
- 2. Online course may be more attractive for people working full time and/or people having children at home (aged 0-5 years).**
- 3. Interaction among students and with the instructor contributes to satisfaction and to the learning environment. Therefore, courses which feature frequent and regular communication as a requirement, or which feature a variety of options and opportunities for communication may improve students' levels of satisfaction and augment the learning environment.**

Recommendations

Based on the findings, information, and conclusions, the researcher divided the recommendations in this study into two parts: recommendations for community colleges and recommendations for further research.

Recommendations for Community Colleges

1. Some participants reported that some of the websites were hard to use, that the websites need improvements, and that the entire course must be available from the start on website. The researcher believes that the development of online courses (specifically home pages) seems to be occurring at the individual instructor level. Therefore, a recommendation is offered to establish a review board at each community college offering online courses, featuring knowledgeable persons in this field, to review the efficacy of existing online courses and to develop ways to improve the quality of online courses. For example, standardizing the software used for online courses may facilitate both instructor and student use.

2. In this study students reported that online course instructors differed in instructional methodology such as student assessment methods, student-student interaction, student-instructor interaction, etc. Therefore the researcher believes that community colleges –statewide or nation-wide- should establish training modules to teach instructors the fundamentals of online instruction. These modules could include information about the differences between the traditional classroom (face-to-face) interaction and electronic interaction, as well as the technical properties of the courses being offered. Such instruction would allow instructors to use their time wisely and efficiently in the teaching process.

3. According to Lane (1989), and Magalhaes and Schiel (1997) data gathered through student and teacher surveys can be analyzed to identify strengths and weaknesses of the course. These data can be used to improve the quality of online courses and programs from their inception. Therefore the researcher believes that community colleges should institute quantitative and qualitative evaluations to evaluate the quality of online learning for all students and instructors. This could be a part of an overall accountability process required by governing or accrediting agencies but would be designed especially to evaluate the quality of online courses.

Recommendations for Further Research

1. In this study, the gender distribution of students taking online courses was 69 percent female and 31 percent male. This preponderance of females engaged in online courses is the opposite of what one might expect, since Internet users in general are estimated to be 75-85 percent male (Quarterman, 1996). The proportion of female online students is almost as unbalanced as that of the Internet users as a whole (Townley, 1997). Therefore further research could be conducted to determine the reasons behind the large number of female students taking online courses in Colorado, nation-wide, and even outside the United States. If this type of distance education is attractive to women because it is more accessible to women or is culturally more palatable, then its contribution to educational equity should be evaluated.

2. In this study some students reported that the student-student interaction levels differ from one college to another. Some students recommended that student-student interaction should be mandatory in an online course. Therefore further research could be done to determine the factors that contribute to interactions among students. How can

schools increase and monitor student-student interaction? Should instructors require electronic communication as a part of the course evaluation/grade? What other factors affect student-student interaction? How can instructors measure the time and quality of interactivity among students and between students and instructors?

3. Further research could be done that would encompass a larger population of students. There are many specific issues that need to be addressed in this area: comparisons such as students' perceptions of online courses in general; how different content areas are best presented online; the individual effect of different instructors; success of the same instructor teaching similar online classes in different semesters or at differing course levels; changes in students from the beginning to the end of the course; and the attrition of students in online courses compared to attrition rates for other types of learning, or for distance education in general? What are the causes of such attrition and how might it be reduced?

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Appendices

Appendix A

LETTER

**SENT TO ADMINISTRATORS AND INSTRUCTORS
IN THE COMMUNITY COLLEGES WHICH PARTICIPATED
IN THIS STUDY USING E-MAIL**

Dear Administrators and Instructors

We are writing this letter to request that you cooperate in a research study that we are conducting on online courses. This study will be contribute to a growing base of information and knowledge that will serve to improve and develop online courses, particularly help community colleges in their online courses evaluation. So, your participation is important and critical to the success of the study.

Please e-mail the following survey to your students in online courses. In a week, we will send you another e-mail asking you to prompt your students to respond to the survey, if they have not already done so.

We are asking students to e-mail the survey directly to us. However, it is likely that some will mistakenly e-mail the survey to you; if this happens, kindly forward the message to the following e-mail address: aljarrah@lamar.colostate.edu.

For students taking more than one online course, we are requesting that they complete a separate survey for each course.

Any questions about this research may be directed to:
Abdul Aljarrah
14865 E. Alabama Place
Aurora, CO 80012
Phone & FAX: (303) 873-6365.

Thank you for your time. We appreciate your cooperation.

Sincerely,

Coordinating research advisor:
Dr. Gene W. Gloeckner
Director of Graduate Programs
Colorado State University

Abdul Aljarrah
Colorado State University

Appendix B

COVER LETTER

SENT TO PARTICIPATING STUDENTS

Dear Online Courses Student:

We are writing this letter to request that you participate in a research study that we are conducting on online courses as a partial of the requirements for a doctoral degree at Colorado State University. This study will be contribute to a growing base of information and knowledge that will serve to improve and develop online courses, particularly help community colleges in their online courses evaluation.

This survey will help us to evaluate online courses and better understand their educational potential. This survey will take only a few minutes to complete and you are free to answer only the questions that are related to your experience. In addition, if you want to express your feelings about any other issues regarding online courses, please feel free to do so.

In responding to this survey, **DO NOT "REPLY" DIRECTLY TO YOUR INSTRUCTOR**, who is sending this to you from your college. **PLEASE SEND IT TO THE FOLLOWING E-MAIL ADDRESS:**

aljarrah@lamar.colostate.edu

If for any reason, you cannot use e-mail to reply to this survey, please mail or FAX it to the address below.

Abdul Aljarrah
14865 E. Alabama Place
Aurora, CO 80012
Phone & FAX: (303) 873-6365.

Although your name does accompany an e-mail response, a buffer will be employed to store and read your response without your name. The researcher will copy your e-mail content only and paste it to another file without your e-mail address or any other identification information about you. Your e-mail will be deleted directly after this process has been completed. This will ensure confidentiality.

We are pleased to answer any questions you may have about this research. Please contact Abdul Aljarrah at the address listed above.

Thank you for your time in completing this survey.

Sincerely,

Coordinating research advisor:
Dr. Gene W. Gloeckner
Director of Graduate Programs
Colorado State University

Abdul Aljarrah
Colorado State University

Appendix C
SURVEY SENT TO STUDENTS
USING E-MAIL

Please read the following directions before you start answering the survey questions.

1. If you are under 18-years old, let your parents write us permission that, at the address listed above, allows you to respond to this survey due federal regulations.
2. If you have received more than one of these questionnaires, please fill out one for each online course you are taking.
3. Respond to the questions directly on the e-mail.
4. FORWARD THIS COMPLETED SURVEY DIRECTLY TO THE RESEARCHER AT

aljarrah@lamar.colostate.edu

PART I

Instruction

In this part, please write your answer next to each item.

1. Course Name:
2. Course Number:
3. College Name (you are taking this online course):
4. Your Gender:
5. Your Age:
6. Your Ethnicity:
7. Work Status (Is it full "40 hr/week at least" or part time or not working):
8. Do you have young children living in your home (ages 0-5):
9. Number of online courses, including this one, have you taken to date:
10. In the following list, place an "X" by each type of communication that you used in each course. Considering the time that you spent communicating directly with your

TEACHER, and with OTHER STUDENTS. Indicate how much that time was spent using the types of communication listed below. The total should add up to 100 percent in each column. For any type of communication that not available or not been used, place a "0" in the blank.

<u>Type of communication</u>	<u>% with teacher</u>	<u>% with other students</u>
i. E-mail	-----	-----
ii. Electronic bulletin boards	-----	-----
iii. Telephone	-----	-----
iv. Chat rooms	-----	-----
v. Fax	-----	-----
vi. Regular mail	-----	-----
vii. Face to face	-----	-----
viii. Threaded discussion	-----	-----
ix. Others (specify)	-----	-----

PART II

Instruction

In part II, your answer will explain your agreement with each item of the survey. Please write next to each items one of these numbers: 1, 2, 3, 4, 5, 6, and 7 (1= Very Strongly Disagree, 2= Strongly Disagree, 3= Disagree, 4= Uncertain; 5= Agree; 6= Strongly Agree; 7= Very Strongly Agree)

1. Course objectives were made clear at the outset.
2. The course homepage was well edited, presented and produced.
3. The selected readings were interesting.
4. The amount of assignments was appropriate.
5. The course objectives were met.

6. The instructor communicated the criteria by which my assignments were to be graded.
7. The instructor provided meaningful feedback on assignments and questions.
8. The assessment methods (e.g., exams, exercises, assignments, etc.) were fair and reasonable.
9. The instructor encouraged me to remain on-task by the use of a variety of strategies.
10. The instructor was essential to effective learning in this course.
11. The instructor demonstrated knowledge of the subject matter.
12. The instructor provided additional information when asked.
13. The instructor was enthusiastic about teaching this course.
14. The instructor created situations that made course topics applicable.
15. The instructor emphasized key concepts and important elements in the course.
16. My learning was enhanced by contact with other students.
17. Help received from other students was very important.
18. Students were cooperative in working with me.
19. Interacting with other students made for a more pleasant learning experience.
20. The technology used in this course helped me improve my communications skills...
21. The college admission forms were easy to complete.
22. The college admissions personnel were helpful.
23. The course registration was easily accomplished.
24. I received assistance from college advisers for this course.
25. I received assistance from college library staff for this course.
26. The technology used for this course enabled me to learn the content of the course.
27. I would take another online course.
28. I feel I learned more than I would have in a traditional classroom based.
29. This online course provided encouragement me to continue my education.
30. The workload required for this course was too much.

Part III

Instruction

In this part

- a. **List three things you liked about this course.**
- b. **List three recommendations to improve this course.**
- c. **Please feel free to add any additional comments about your experience or feelings regarding online courses.**

Appendix D

APPLICATION TO USE HUMAN SUBJECT (H-100, REV 4/98)

COLORADO STATE UNIVERSITY HUMAN RESEARCH COMMITTEE

Colorado State University Human Research Committee Application to Use Human Subjects (H-100, Rev 4/98)

Complete Part A and Part B. On separate pages, list all questions from Part C and respond to each as applicable. Part C should be replicated on your computer. For full review protocols, return the ORIGINAL (with original signatures) and 11 copies (each with all attachments except proposal/dissertation/thesis) to Regulatory Compliance, 410 University Services Center. Assistance is available on our web page at <http://www.research.colostate.edu/regulatory/>.

Action of the CSU Human Research Committee

<input type="checkbox"/> Approved as EXEMPT research	Approval number: _____ Period: _____
<input type="checkbox"/> Approved as NON-EXEMPT research	Approval number: _____ Period: _____
<input type="checkbox"/> Conditions: use of approved consent form	
<input type="checkbox"/> Other (see attachment for details)	
<input type="checkbox"/> Cannot be approved as currently submitted (see attached memo for details)	
<input type="checkbox"/> Tabled (see attached memo for details)	
HRC Authorization: _____ Date: _____	

Part A. COVER SHEET

New Protocol **Resubmission**

1. Project Title: Distance education for all ages: Community college students' perspectives and attitudes toward online courses.
2. Principal Investigator (PI): Dr. Gene Gloeckner
3. Telephone: (970) 491-7661
4. Department: Education
5. E-mail: ggloeckner@cash.colostate.edu
6. Co-Principal Investigator: Abdelmuhdi Ali Aljarrah
7. Telephone: (303) 873-6365
8. Department: Education
9. E-mail: aljarrah@lamar.colostate.edu
10. If Co-PI is a student, is this project for a: Thesis Dissertation Neither
(Attach thesis/dissertation prospectus, abstract, or methodology chapter.)
11. Date project activity to begin: Upon HRC approval
12. Will this project be supported by external funds? Yes(answer 13-15) No (go to signatures)
13. Funding Agency (attach proposal or methodology section):
14. Grant/contract number:
15. Proposal deadline:

As the PI submitting this proposed research and signing below, I agree to conduct the research involving human subjects as presented in the protocol or modifications to it and as approved by the Department and the Human Research Committee; to obtain and document informed consent and provide a copy of the consent form to each subject unless this is waived by the HRC; to present any proposed modifications in the research to the HRC for review and approval prior to implementation; to retain records for the mandated lengths of time; and to report to the HRC any problems or injuries to subjects.

PI Signature: _____ Date: _____

Department Chair/Head or Acting (circle which) Signature

My signature below confirms that I have read this protocol and approve of this research.

Signature: _____ Date: _____

Part B. ATTACHMENTS

Indicate those included for this protocol.

_____ Advertisements or posters

_____ Telephone scripts or other recruitment scripts

Consent form(s), including parental permission and child assent for minors (model form available) [see the cover letter of the survey].

_____ Cover letter(s), on departmental letterhead, include main elements of informed consent, with faculty signature

_____ Letter(s) from counselors/specialists itemizing credentials, on letterhead

Letter(s) of agreements from organizations, on letterhead, with original signatures

_____ Instruments/tests/photos to be used; note if purchased or provide documentation allowing use

_____ Debriefing materials

_____ Principal Investigator's current résumé if one is not currently on file with the Regulatory Compliance Office

_____ Proposal copy or methodology section (only one copy)

OR

Thesis/dissertation prospectus, abstract, or methodology chapter (only one copy)

I think this qualifies for the following type of review:

Exempt Category number _____ Expedite Category number _____ Full

Office Use Only:

Tracking number: _____

Type of Review: Exempt Expedite Full Category # _____

FDA: Yes No

Elapsed time:

Other:

Part C. PROTOCOL INFORMATION

Objectives:

1. The purpose of this research is to gather evaluative data about online courses from Colorado Community Colleges Online (CCC Online) students. At the end of this research, evaluator will be able to describe student perceptions and attitudes toward these courses in six areas: course structure; student-teacher interaction; teaching content; student-student interaction; college staff assistance; and general satisfaction. This data will be contribute to a growing base of information and knowledge that will serve to improve and develop online courses, particularly help community colleges in their online courses evaluation.

Human Participants Description

2. The source of the participant population is a CCC Online student who is not under 18-year old and registering in at least one online course.
3. The selection process should result in a maximum of 1517 students to complete the questionnaire.
4. The characteristics of the participants will be not under 18-year old and he/she registering in at least one online course.
5. Recruitment procedures: A maximum of five community colleges, from CCC Online, students who are registering in at least one online courses will be choose and asked to complete the questionnaire.
6. Recruitment materials: The researcher chooses five from the largest community colleges, from CCC Online, in the number of students who are enrolling in online courses. The students will be received the questionnaire via e-mail and their responses are considered as an approval for their participating in this study.
7. Criteria for excluding students: Association with the participant's community colleges instructors and administrators. Students would be excluded only if they are under 18-year old.
8. Rationale for using "at-risk" populations: N/A.
9. A letter of approval from the participants of the community colleges has been obtained and attached to this protocol.
10. There are no other matters pertinent to the human participants.

Procedures to be followed with participants (Methodology)

11. Specific location of the study: N/A.
12. The independent variables are: gender; ethnicity; age; course subject; work; family status (children); and number of online courses experienced previously. The dependent variables are: course structure, student-teacher interaction; teaching content; student-student interaction; college staff assistant; general satisfaction; and overall satisfaction (score determined by combining all scores).
13. A questionnaire has been prepared for participants. This questionnaire is attached. The questionnaire has to be delivered for each participant via e-mail by the instructors and administrators in each participant college.

14. In spring 1999, the instructors and administrators will be delivered the questionnaire via e-mail to their students in online courses.
15. Specific equipment: N/A.
16. Factors leading to stopping procedures: N/A.
17. Biological sample to be taken: N/A.
18. Debriefing method and materials: The administrators and instructors in the participants colleges will receive letter (via e-mail), from the researcher, shows explanations for the survey instructions and the survey delivery method for the participants in this study. Research procedures will be explained to the subjects by a cover letter to the survey. Also, the confidentiality and the instructions for filling out the survey and how to send it back to the researcher will be explained in the survey cover letter.
19. Other aspects of the procedures: N/A.

Risks to participants

20. There are no known potential risks in this project.
21. Methods for minimizing risks: N/A.
22. Other methods of handling potential risk: N/A.
23. Other matters relative to risk to participants: N/A.

Benefits to participants

24. There are no direct benefits to the participants.
25. The study could benefit future online course students, by improving these courses to be more beneficial especially the online course students.
26. Benefits accruing to others from this study may be to help inform policy makers, school administrators, teachers, students, and the textbook authors.
27. There are no other aspects of benefits to participants.

Consent procedures

28. The participants will be supplied with "Informed Consent" to be delivered to them via e-mail.
29. Consent form (see the cover letter of the survey).
30. There are no other aspects of the consent process.

Confidentiality

31. Protecting the identity of the individual participants: No reference to student identity will be made in any distribution of evaluation information. A buffer will be employed to store and read the responses without names and e-mail addresses.
32. Maintaining data after study is complete: Colorado State University will take responsibility for all data collected. The data will be archived in the PI's office for three years.
33. Retention of consent forms: The consent forms is a part of the survey. The survey will be delivered via e-mail. So, the consent will be archived in the PI's office for three years.
34. Audio-or videotaping N/A.
35. There are no other aspects of confidentiality.

