Elementary Computer-mediated Online Distance Education: Identification of Criteria for Successful Implementation and Practice

W. Greg McCaughey, B.A., B.Ed.

Department of Graduate and Undergraduate

Studies In Education

Submitted in partial fulfillment of

the requirements for the degree of

Master of Education

Faculty of Education, Brock University

St. Catharines, Ontario

Abstract

This study had three purposes related to the effective implementation and practice of computer-mediated online distance education (C-MODE) at the elementary level: (a) To identify a preliminary framework of criteria or guidelines for effective implementation and practice, (b) to identify areas of C-MODE for which criteria or guidelines of effectiveness have not yet been developed, and (c) to develop an implementation and practice criteria questionnaire based on a review of the distance education literature, and to use the questionnaire in an exploratory survey of elementary C-MODE practitioners.

Using the survey instrument, the beliefs and attitudes of 16 elementary C-MODE practitioners about what constitutes effective implementation and practice principles were investigated. Respondents, who included both administrators and instructors, provided information about themselves and the program in which they worked. They rated 101 individual criteria statements on a 5 point Likert scale with a point range that included the values: 1 (Strongly Disagree), 2 (Disagree), 3 (Neutral or Undecided), 4 (Agree), 5 (Strongly Agree). Respondents also provided qualitative data by commenting on the individual statements, or suggesting other statements they considered important.

Eighty-two different statements or guidelines related to the successful implementation and practice of computer-mediated online education at the elementary level were endorsed. Response to a small number of statements differed significantly by gender and years of experience. A new area for investigation, namely, the role of parents, which has received little attention in the online distance

education literature, emerged from the findings. The study also identified a number of other areas within an elementary context where additional research is necessary. These included: (a) differences in the factors that determine learning in a distance education setting and traditional settings, (b) elementary students' ability to function in an online setting, (c) the role and workload of instructors, (d) the importance of effective, timely communication with students and parents, and (e) the use of a variety of media.

Acknowledgements

This project could not have been completed without the support of many people whose contributions I wish to gratefully acknowledge.

I would like to thank the members of my thesis committee Dr. Jim Kerr, Dr. Kris Kirkwood, and Dr. Joanne Graham for their expert guidance and support throughout the various stages of this project. Special thanks to Dr. Jim Kerr for taking on this project without having had worked with me before. I would also like to thank professors Carmen Schifellite and Tony DiPetta for their assistance with the initial literature review that led to the development of the thesis topic.

This project could not have been accomplished without the support and cooperation of the many postsecondary and elementary online distance education instructors who agreed to participate in this study, and I wish to express appreciation to them.

In keeping with the ongoing tradition related to the publishing of major pieces of scholarly work, I would like to give honorable mention to the current and former members of the Wednesday Night Poker Club for over 30 years of fun and friendship. Finally, I would also like to express my deepest appreciation to my wife Carol for her continual support and fine editing skills throughout the many long hours, weeks, months, and many countries and continents over which this project progressed.

Table of Contents

Page

Page

Page

List of Tables

CHAPTER ONE: THE PROBLEM

Introduction

This study had three objectives related to the effective implementation and practice of computer-mediated online distance education at the elementary level. First, it identified a preliminary framework of guidelines for effective implementation and practice. Second, it sought to identify additional areas for which guidelines should be developed. Finally, it developed an implementation and practice criteria questionnaire based on a review of the distance education literature. This instrument was used to survey individuals currently involved in the delivery of courses via computer-mediated online distance education at the elementary level. Participants were asked to express their opinions concerning the validity of the criteria identified in the questionnaire. Results from the survey were used to further refine the instrument.

Background of the Problem

Distance education is not a new phenomenon. However, in recent years it has become a major focal issue in education (Simonson, 1997). With individual courses and complete programs increasingly being offered through computer-mediated communication (CMC; Santoro, 1998), or Web-Based instruction (WBI; Khan, 1997), by way of the Internet or World Wide Web (Barron & Lyskawa, 1998; Brown & Hansen, 1998; Khan, 1997; Pan, 1998, Santoro, 1998), the technology used for the delivery of distance education has changed dramatically.

Computer-mediated online distance education, hereafter referred to as C-MODE, has been seen by many to have potentially profound effects on the practice of distance education. Soon after the popular adoption of the Web, Hawkridge (1995) described C-MODE as significant enough to propagate an exponential expansion, or Big Bang, of distance education. Dryli and Kinnaman, (as cited in Schlough & Bhuripanyo, 1998) described it as the fastest developing educational phenomenon in the history of the world. Carlson, Repman, Downs, and Clark (1998) have expressed the opinion that C-MODE is on the cutting edge of instructional design methodology. Perraton (2000) claimed that the growth of the Internet, changes in the price availability and power of computers, and changes in satellite technology may have profound effects on distance learning. Khan (1997) likewise supported the notion that this was a significant development when he claimed that the Web was one of the most important economic and democratic mediums of teaching and learning at a distance.

Historically, increasingly sophisticated communication technologies have been adopted for distance education purposes as quickly as they develop (Schlosser & Anderson, 1994). Such is the case with computer technology, specifically its ability to provide direct and indirect communication between individuals and groups all over the world, virtually instantaneously, in a variety of media. Few would question the meteoric increase in use and acceptance of the Internet or the World Wide Web in the past few years. [1] Indeed, over the period that this project was proposed and undertaken, dramatic changes took place in Internet usage and the related technology industry.

---

[1] In this study Internet, World Wide Web, and Web will be used interchangeably.

In 1999 the Internet phenomenon seemed to be making its next great leap in acceptance and use. Over the Christmas period North America passed through a holiday gift-buying period that was defined in the popular press as the coming of age of e-commerce and the acceptance of online shopping.

The year 1999 also will be remembered as a year in which technology stocks, particularly Internet-based stocks, yielded dramatic increases. The value of most of these stocks rose well beyond what might normally be expected considering their current limited earning abilities. The dramatic increases were apparently driven more by the potential of what these companies might become rather than by their current ability to generate revenues or profits. The NASDAQ stock index reflected that increase. On January 4, 1999, the index was at 2,208 points. On January 3, 2000, it had moved up to 4,131 points, an increase of 87.1 %.

Speculation about the convergence of various media, including the Internet, telephone, and television, into a single delivery format manifested itself in the amalgamation of America Online Inc., arguably the world's largest commercial Internet service provider, and the conventional media conglomerate Time Warner Inc.

By 2002 many aspects of this rush to embrace the Internet and its related technology had changed. By the spring of 2002 the NASDAQ stock index had fallen to the 1,600 point range after reaching a high just above 5,100 on March 10, 2000, and the technology industry was mired in a period of limited growth or decline. However, Internet usage around the world continued to increase steadily throughout this period.

The rapid development of C-MODE, combined with the recent rapid commercial adoption of the Internet, is of interest to educators for a number of reasons. There have been dramatic increases in both the forms of communication media used on the Internet in the last few years, and the effectiveness with which they are delivered and practically used. Increased commercial attention will likely lead to an even more dramatic evolution of these technologies. The result should be enhanced delivery and interactive abilities for institutions that currently are, or are preparing to, offer distance education. Also of consideration will be the extent to which the delivery of education services over the Internet, or some soon to be developed convergent media, becomes commercially attractive. Certainly, education will be seen by many as a potentially significant market segment. It is likely that we are entering a period of rapid development of commercially sponsored, computer-mediated online distance education offerings. It is also reasonable to assume that this development will occur at all academic levels.

It is interesting to note that scholarly work related to the practice of distance education at the postsecondary level has recently begun to reflect this theme of commercialization. The most obvious example is an editorial by Moore (1999) in which he compared the postsecondary marketing of distance education programs to retail practice.

If the literature is an accurate reflection of the distribution of online offerings, the majority of online distance education experiences are currently offered at the postsecondary level. Barron and Lyskawa (1998) report that a study conducted by the U.S. Department of Education in 1995 indicated that 79% of higher education

institutions were planning to offer courses through Internet-related technologies. No percentages were cited for the elementary or secondary levels.

Parents who are interested in home schooling for their children almost certainly represent a significant market for distance education separate from the postsecondary market. Keegan (1996) reported that in 1995 over 5 million students were enrolled in schools associated with the Council for Distance Education and Training, formerly the National Home Study Council. This number represents both elementary and secondary level students.

In a recent publication Perraton (2000) indicated that in industrialized countries between 5 and 12% of students are likely to be studying at a distance, and in developing countries between 10 and 20%. Harry and Perraton (2000) presented slightly modified numbers for industrialized countries placing enrollments at a distance at between 5 and 15% in many and over 25% in a few.

In the province of Ontario, the jurisdiction in which this study was based, in the academic year 1997-98, 369,506 full-time and 86,354 part-time students, or 455,860 total students, were enrolled at universities and colleges. This information was found at the Statistics Canada web-site (http://www.statcan.ca). According to the province's Ministry of Education and Training web-site (http://www.edu.gov.on.ca), 701,191 students were enrolled at the secondary level and 1,394,439 at the elementary level during the same period. Therefore, in Ontario 18% of the total student body was enrolled at the postsecondary level, 27% at the secondary level, and 55% at the elementary level. It is likely that these proportions would be similar in most educational jurisdictions. What is most striking is the fact that although distance

education has in the last few years grown dramatically and has become a significant educational issue, it is currently being aimed primarily at only 18% of the total student body.

Statement of the Problem Situation

Although distance education is primarily being undertaken at the postsecondary level, some work is being conducted in the other two areas. Links to a number of projects where online distance education is being practiced with elementary and secondary level students were found by searching on the Internet using conventional search engines such as Yahoo, Hotbot, and Webcrawler. The elementary programs identified have been listed at the Elementary Online Distance Education Clearing-House web site (http://www.ed.brocku.ca/~gmccaugh/). This web-site was developed specifically to support this project.

The initial search for elementary programs identified 22 boards of education or institutions that were offering online programs. These programs range from those sponsored by governments to private online enterprises. In the current climate of close scrutiny of public education, the ongoing search for educational alternatives, and the dramatic rise in e-commerce, it is likely that in the next few years there will be a dramatic increase in the number of online educational opportunities available at the elementary level.

Scholarly literature, as yet, does not reflect the development of this phenomenon. When elementary distance education is discussed at all in either the general or online distance education literature, it is usually considered in an all-encompassing K-12 context (Berge & Collins, 1998; Cavanaugh, 1999; Fagan, 1997;

Hanson, 1997; Maushak & Manternach, 1997; Merkley, Bozik & Oakland, 1997; Mortera-Guitierez, 1998; Owston, 1997; Schlosser & Anderson, 1994; Wellburn, 1999). An initial literature search revealed only one group of authors, Ross, Morrison, Smith, and Cleveland (1991), who have attempted to deal with elementary C-MODE as a distinct, separate issue. The contributions of these various authors are examined in greater depth in the literature review section of this document.

Although the field of elementary C-MODE is a relatively new phenomenon, the general absence of scholarly investigation is of concern, as is the apparent lack of an operational support infrastructure. When conducting the search for elementary programs, no evidence of unifying associations or organizations was uncovered. Although it may be premature to assume from that there is no communication between these programs, it does appear that many may be operating in isolation.

In the literature, a number of attempts were made to determine criteria related to the effective implementation and practice of distance education in general (Hawkes, Cambre, & Lewis 1998; Moore, 1990; Perraton, 1988; Sorenson, 1997; Verduin & Clark, 1991), and C-MODE (Everett, 1998; Findley & Findley, 1997; Mory, Gambill, & Browning, 1998). However, none of these has specifically addressed criteria relevant to the implementation and practice of C-MODE at the elementary level. It is not yet known if practitioners have established their own guidelines.

It is essential that we begin to identify criteria relevant to the elementary level and refine them as this phenomenon develops. Given the large numbers of students enrolled in regular elementary programs there is potential for significant numbers to

become enrolled in one of these programs. For the purposes of this study, elementary students are defined as those enrolled in a kindergarten through grade 8 program.

Purpose of the Study

In this study, a preliminary framework was developed of guidelines relating to the effective implementation and practice of C-MODE at the elementary level. It is hoped that this framework can be used by current practitioners to refine their programs and to provide guidance to those seeking to establish new programs. Criteria identified in the literature as being important to the implementation and practice of C-MODE at the postsecondary level, and important to general distance education, formed the basis for the development of a framework. A second purpose was to identify other areas or criteria, which may not have been identified in the literature, which are seen as meaningful.

A third purpose served by this study is the development of the survey questionnaire. The postsecondary criteria identified in the literature guided the development of a survey questionnaire which was used to poll the opinions of individuals involved in the delivery of C-MODE at the elementary level with the aim of establishing the preliminary, working framework of elementary guidelines. The working framework is based on the criteria the participants identified as significant in the survey instrument. Responses from participants were used to refine the instrument for use in future studies.

Definition of C-MODE

Computer-mediated online distance education needed to be defined to establish the context in which this study was undertaken. Historical and contemporary definitions were examined, and then a working definition for this project was established.

It should be noted that once one examines the broad definitions of general distance education, most others can generally be organized into a framework based upon technological developments.

General Definitions of Distance Education

Before the emergence of the Internet and its widespread use to deliver educational programs, several attempts were made to define distance education. Keegan's (1988) examination of the definitions of Holmberg, Moore, Peters, and French law resulted in his identification of six constituent elements of a definition of distance education. These included:

> the separation of teacher and learner, which distinguishes it from face-to-face lecturing; the influence of an educational organization, which distinguishes it from private study; the use of technical media, usually print, to unite teacher and learner and carry educational content; the provision of two-way communication so that the student may benefit from or even initiate dialogue; the possibility of occasional meetings for both didactic and socialization purposes (p. 30)

and "the participation in an industrialized form of education, which if accepted, contains the genus of radical separation of distance education from other forms" (p. 30).

In Börje Holmberg's (1995) most recent edition of his important text Theory and Practice of Distance Education, he defined distance education as

> covering the various forms of study at all levels which are not under the continuous, immediate supervision of tutors present with their students in lecture rooms or on the same premises but which, nevertheless, benefit from the planning, guidance and teaching of a supporting organization. (p.2)

Lynch and Corry (1998) stated that "Distance Education should be understood as planned experiences which result in changes in a client's cognition, affect, and/or behavior when the client is separated from the sources of knowledge and instruction." (p.171).

Perraton (2000) reiterates an earlier 1982 definition when declaring that distance education is "an educational process in which a significant proportion of the teaching is conducted by someone removed in space and/or time from the learner" (p. 13).

Interactive Telecommunication Technology Definitions of Distance Education

Throughout the 1980s and early 1990s, definitions began to reflect the move towards greater use of interactive telecommunication technologies. Garrison and Shale (1987) stated that recent advances in distance education delivery technology made it necessary to expand Keegan's (1983) criteria. They proposed three new criteria: "1. Distance education implies that the majority of educational

communication between (among) teacher and student(s) occurs noncontiguously. 2. Distance education must involve two-way communication between (among) teacher and student(s) for the purpose of facilitating and supporting the educational process" (p.11) and "3. Distance education uses technology to mediate the necessary two-way communication" (p. 11).

Barker, Frisbie, and Patrick (1989) wrote,

> telecommunications-based distance education approaches are an extension beyond the limits of correspondence study. The teaching-learning experience for both instructor and student(s) occurs simultaneously – it is contiguous in time. When an audio and/or video communication link is employed, the opportunity for live teacher-student exchanges in real time is possible, thereby permitting immediate response to student inquiries and comments. Much like a traditional classroom setting, students can seek on-the-spot clarification from the speaker (p. 25).

Simonson and Schlosser (1995) defined distance education as

> formal, institutionally based educational activities where the teacher and learner are normally separated from each other in location but not normally separated in time, and where two-way interactive communication systems are used for the sharing of video, data, and voice instruction (p. 13).

Moore (1990), having already revised his definition of distance education several times, did so again to reflect the trends to new technologies. He asserted that "distance education is all arrangements for providing instruction through print or

electronic communications media to persons engaged in planned learning in a place or time different from that of the instructor or instructors" (p. xv).

Recognition of Computer Use Definitions of Distance Education

More recently, additional contributions to the definition of distance education have begun to emerge. Although none relate exclusively to the delivery of educational programs over the Internet, they acknowledge the role of computers and all reflect their articulation within a period when the Internet was experiencing significant development.

Evans (1995) expressed the belief that globalization and related recent technological developments, such as computer communications and supersonic air travel, along with societal changes, have inspired new ways of looking at distance education. Edwards (1995) saw distance education as being rooted in learning opportunities conducted through mass-produced courseware.

When reexamining the Simonson and Schlosser (1995) definition in a more recent publication, Simonson (1997) chose to drop the premise that instructors and students are not separated in time. This reflects the asynchronous nature of some web-based communications. Keegan (1995) has also begun to reexamine the definition of distance education. He suggests that recent technological developments have allowed virtual classroom experiences, no longer making face-to-face, interpersonal communication a prerequisite when teaching at a distance.

Moore and Kearsley (1996) defined distance education as

> planned learning that normally occurs in a different place from teaching and as a result requires special techniques of course design, special instructional

techniques, special methods of communication by electronic and other technology, as well as special organizational and administrative arrangements. (p. 2)

Internet/Web Definitions of Distance Education

Most recently, definitions have begun to appear in the literature that are specific to online distance education. Feyten and Nutta (1999) define the key elements of Virtual Instruction as "1) computer-mediated communication, 2) active-learning type interactions, 3) instruction taking place from a distance, and 4) synchronous or asynchronous communication" (p. xv). Khan (1997) defines Web-based instruction as "a hypermedia-based instructional program which utilizes the attributes and resources of the World Wide Web to create a meaningful learning environment where learning is fostered and supported" (p. 6).

Ways of Understanding and Conceptualizing Distance Education

Examination of the body of literature also revealed a number of ways of understanding the variety of distance education definitions. Schlosser and Anderson (1994), in a review of general distance education literature, argued that distance education has many different definitions because it is practiced differently and in different contexts all over the world. Hoffman (as cited in Hanson, 1997) added that perhaps it was time to stop concentrating on trying to build definitions based upon the differences between distance and conventional education and focus on how they converge.

It also becomes clear that there are different ways of conceptualizing what is or should be happening in teaching/learning at a distance. Wellburn (1999), in

addressing this point, itemized the many terms used, including, distance teaching, distance learning, distributed learning, interactive distance education, distributed training, virtual classrooms, online courses, open learning, and distance education. These differing names represent subtle differences in the role or location of the instructors and the learners, which individual or institution guides the teaching/learning, and what or how technology is used to facilitate the process.

Another way of conceptualizing the phenomenon (Edwards, 1995; Keegan, 1983; Keegan, 1996; Moore & Kearsley, 1996) involves breaking distance education into two distinct subgroups. Keegan expressed these as distance teaching, a more directed form of education, and distance learning, a more independent-study-based learning experience. This study is primarily interested in the delivery of educational programs or directed teaching.

Study Definition

We recognize that it may be difficult to establish a single definition that would address how C-MODE is practiced in different contexts all over the world, as Schlosser and Anderson (1994) suggest. However, it is important to establish a common frame of reference or context for this study. For the purposes of this investigation C-MODE will be defined as: The computer-mediated, online, synchronous and asynchronous provision of educational content and communication between (among) instructor(s) and learner(s) for the purpose of facilitating the educational process, involving an educational institution and participating learner(s) where learner(s) and instructor(s) are physically separated, and the students are not in

a conventional classroom setting. This definition is largely based on the Garrison and Shale (1987) definition.

Rationale for the Study

To date, there have been a minimal number of scholarly investigations of C-MODE at the elementary level. In this study an attempt was made to begin to fill the void in the research and literature related to this issue.

Importance of the Study

This study will contribute to both practice and knowledge. First, as previously stated, this study provided an initial set of guidelines which reflect the opinions of individuals currently practicing C-MODE at the elementary level. Others can use these, in turn, when implementing new programs or seeking to modify existing programs. It is hoped that this will ultimately enhance the learning experience for the students involved and contribute to making this methodology as pedagogically sound as any other.

Second, it is speculated that new areas or criteria identified in this study, hitherto not identified in the literature, could form the basis of future research.

Third, it is hoped that in some small way it will act as impetus for continued collaborative review and discussion of C-MODE practice by institutions, organizations, and individuals involved in its delivery and research. This process may be initiated by the establishment of the web-site created to support this study which can be maintained to function as a centralized clearinghouse for this issue.

Fourth, it is hoped that the results of this study and the survey instrument produced will act as an impetus for increased research of this issue. As with any newly developing educational phenomenon, it is essential that its evolution be rigorously monitored.

Fifth, the literature review identifies a broad range of issues related to the general practice of C-MODE at the elementary level. Again, it is hoped that this information will be of some benefit to current and prospective program developers.

Sixth, although this study did not specifically attempt to empirically examine the potential positive or negative attributes of this practice, it did seek to draw awareness to its potential impact. Given that the numbers of students enrolled at the elementary level greatly surpass all others, it would not take long for the numbers of students involved in a C-MODE program to reach the same levels as currently found at the postsecondary level.

Assumptions, Limitations, and Scope of the Study

Assumptions

A significant assumption made for this project is that there are enough similarities in the practice of C-MODE at all levels that criteria identified at the postsecondary level can be used to develop a survey instrument to be used at the elementary level. Second, it was assumed that those institutions, organizations, and individuals involved in the practice of C-MODE at the elementary level would be interested in participating in a study of this nature. Third, although a small number of

elementary online programs have been identified, it was assumed that a large enough survey sample could be solicited.

Limitations

This study, like most, is also subject to a number of limitations. First, and most obvious, is the fact that no attempt was made to survey students. Their insights will eventually be invaluable to the identification of relevant criteria, but it was decided that attempting to involve this group would provide too many logistical concerns at this point. Logistical concerns would include, without being limited to: young students being unable to read or fully understand the statements embodied in the questionnaire, likely inability of students to complete the survey without adult assistance, and possible influence of adults assisting with completing the questionnaire.

Second, although proper Web searches and other literature reviews were conducted using a variety of search engines, there remains the possibility that a number of potential participants have not been identified. The research methodology encouraged participants to identify other potential participants.

Third, this study was somewhat limited in that an attempt was made to solicit responses from only North American, English-speaking programs. Follow-up studies may wish to examine and compare programs offered in other languages.

Scope

In this study individuals currently involved in the delivery of C-MODE at the elementary level were asked to weigh criteria identified as significant at other levels. No attempt was made to determine the pedagogical, philosophical, social, or ethical

merits of the practice of C-MODE at the elementary level. It is simply based on the premise that it is essential that initial guidelines be established to benefit program providers and enrolled students.

Outline of the Remainder of the Document

Chapter Two examines literature relevant to this study. It does so for two purposes: First, it identifies relevant historical, philosophical, theoretical, and operational issues. Second, it reviews the current literature to identify criteria of effective implementation and practice of C-MODE at all levels that could be used to design a survey instrument for use in this study.

Chapter Three describes the methodological approach used in this study. This includes research methodology, research design, participant identification, instrumentation, data collection, ethical considerations, and the identification of the research purpose(s).

Chapter Four reports the findings and analyses them. Reporting includes establishing participant and program profiles, examining response patterns by frequency and percentage, and examining patterns by mean agreement level. Analysis includes presenting the general findings and findings related to individual statements.

Chapter Five summarizes the objectives and findings and examines their implications for practice, theory, and future research.

CHAPTER TWO: REVIEW OF RELATED LITERATURE

Organization of the Present Chapter

Chapter Two reviews the currently available literature to provide an overview of issues relevant to the implementation and practice of C-MODE at the elementary level. It begins with an examination of the historical background of distance education, the Internet and World Wide Web, the use of computers in education, and the development of the Internet in distance education. The discussion then focuses on theories of distance education, technological considerations, perceived benefits and disadvantages, the current practice of C-MODE at the elementary level, student perceptions, and identified criteria at the postsecondary level. Finally, drawn from this literature, specific criteria for the effective implementation and practice of C-MODE are itemized.

History

Distance Education

General distance education traces its historical roots some 150 (Hanson, 1997; Schlosser & Anderson, 1994) to 200 years (Findley & Findley, 1997), where it began in the form of print-based correspondence courses (Findley and Findley, 1997; Hanson, 1997; Schlosser & Anderson, 1994). Holmberg (1986) indicated that advertisements began to appear as early as 1833, offering individuals an opportunity to study by correspondence.

Its historical development can be seen as having four or five distinct phases. Romiszowski (1993) postulated four phases, namely (a) print-based correspondence, (b) radio/television open broadcast, (c) satellite telecasts to subscribing sites, and (d) computer-mediated communication. All four of these have employed technological developments, and to some degree were initiated by such developments (Newby, Stepich, Lehman, and Russell, 1996). Moore and Kearsley (1996) identified five distinct phases or generations in the development of distance education, which are very similar to those proposed by Romiszowski. These are (a) correspondence study, (b) the appearance of Open Universities, (c) broadcast media (radio and television, these lead to teleconferencing), (d) satellite communication and the emergence of consortia, and (e) computer networks and multimedia.

Schlosser and Anderson (1994) identified two characteristics that have marked the development of distance education. They noted that new, increasingly sophisticated communication technologies are adopted as they are developed and that distance education has developed differently in many areas guided by local philosophies and resources.

Hanson (1997) traced the development of distance teaching universities, the first of which was the University of South Africa which opened in 1962. Other institutions of note include the Open University of the United Kingdom and the German Fern Universität. Similar institutions are now found in many countries around the world.

The Internet and World Wide Web

Roblyer, Edwards, and Havriluk (1997) briefly outlined the history of the Internet in an educational context. They stated that the Internet began as an initiative of the United States Department of Defense during the 1970s. Its initial purposes were to allow the exchange of communication and information among researchers working on various defense projects. Its secondary purpose was to ensure continued communication between these groups in the event of a nuclear attack. Because the project was funded by the Advanced Research Projects Agency branch of the Department of Defense, the network was referred to as ARPAnet. Roblyer et al. further pointed out that in the 1980s the provision of funding from the National Science Foundation allowed the development of a similar system for the use of universities to link their existing networks together. As a result, users were able not only to log onto their own institution's networks, they also had the ability to access other sites connected to that network. This formed the basis of what is commonly referred to as the Internet.

The history of the World Wide Web is a very short one. The first version of the Web was run by Tim Berners-Lee and his colleagues at CERN (Conseil Européen pour la Recherche Nucléaire, or the European Particle Physics Laboratory) in Geneva, Switzerland in December of 1990 and placed on the Internet for the first time in 1991 (Crossman, 1997). By 1995 it had eclipsed all other Internet services and become the most widely used format (Crossman).

Computers in Education

According to Roblyer et al. the use of computers in education can be examined in two distinct periods, before and after the introduction of microcomputers. In their text Integrating Educational Technology into Teaching, they identified a number of developments that they consider to be milestones and trends in educational computing. They state that the first use of computers for educational purposes was in 1950 as flight simulators to train pilots at the Massachusetts Institute of Technology and that they were fist used with school children in 1959 to teach binary arithmetic. Following those efforts, mainframe computers were used in a variety of ways to support educational efforts.

Roblyer et al. identified 1977 as the year the microcomputer use was introduced into the classroom. In 1980, Seymour Papert published his seminal work in educational computing, Mindstroms. Not only did Mindstorms initiate the LOGO movement, it also served to introduce a new perspective on how computers could be used in education. According to Jones, Kirkup, and Kirkwood (1993), prior to the release of the book most American schools were concentrating on using computers to assist students learn what they had already been learning. Papert proposed that learning should take place from child-centered exploring using LOGO based projects rather than teacher-directed instruction (Roblyer et al.). This approach placed the student in control of the technology, rather than the technology in control of the student.

According to Roblyer et al. (1997), a number of significant developments took place during the 1980s and 1990s. Educational software became more prevalent, both

specific courseware and authoring software that allowed educators to develop their own courseware. Evaluation of courseware also became popular during this period. The 1980s also saw the rise and fall of the computer literacy movement that promoted teaching students about computers. The late 1980s and early 1990s saw the emergence of integrated learning systems and other networked systems.

Computers in Distance Education

The history of the use of computers and the Web in distance education does not appear to be as well documented in the literature as other aspects. Most authors have simply tracked the general historical development of the Web and/or the Web's rate of adoption. Further investigation of this history is required. Such an inquiry would provide an important contribution to the ongoing study of distance education.

Theory of Distance Education

Many different theories and different approaches to developing theories of distance education have been proposed. A closer examination of the various theories in the literature suggests that, like definitions, after recognition of broader, general distance education theories, most others can generally be organized by a framework based upon technological developments.

General Theories of Distance Education

In the first edition of his enlightening text The Foundations of Distance Education, Keegan (1986) identified three general groups of theories of distance education: theories of independence and autonomy, theories of industrialization of teaching, and theories of interaction and communication. Hilary Perraton (1988)

identified a fourth category or group that seeks to bring together philosophies of education and theories of communication and diffusion. Simonson, Schlosser, and Hanson (1999) refer to Perraton's theory as a synthesis of theories. Schlosser and Anderson (1994) suggested that at the time of their review Perraton's theory was perhaps the most powerful one advanced on how distance education was practiced in most of the world.

Schlosser and Anderson (1994) also stated that the study of distance education has been encumbered by the lack of a single, generally accepted theory and that the number of diverse theories can be seen as a function of the many ways in which distance education is practiced around the world and the many local educational paradigms. They suggest that in the United States, more than in any other part of the world, attempts are made to make distance education more like face-to-face education.

Moore and Kearsley (1996) presented The Theory of Transactional Distance, based upon earlier work by Moore. They identified three elements of distance education: (a) learner independence, which they termed autonomy; (b) Interaction between instructor and learner, designated as dialogue; and (c) characteristics of course design, identified as structure. Transactional distance is defined as "a distance of understandings and perceptions caused by the geographic distance, that have to be overcome by teachers, learners, and educational organizations if effective, deliberate, planned learning is to occur"(p. 200).

Sherry and Wilson (1997) proposed the "transformative" model where the student and the instructor both become "transformed" into learners through the

process of communicating. The instructor can develop new understandings of both the student and the subject matter, while the student is afforded the opportunity to pause and reflect on what she or he is learning.

Interactive Telecommunication Theories of Distance Education

Keegan (1995, 1996) suggested that the introduction of satellite, compressed video, and broadband technologies has resulted in the creation of a virtual classroom environment and this development has not been reflected in theoretical analysis in the literature. The virtual classroom is seen as one where students from remote locales meet and learn synchronously in a virtual setting. He delineated a number of questions that need to be asked about this new environment, including (a) what are its didactic structures, (b) is it a subset of distance education or a separate field, and (c) what is the relationship of its cost and educational effectiveness to distance and conventional education? In the third edition of The Foundations of Distance Education, Keegan (1996) elaborated on the perceived differences between distance education and virtual education, including time-synchronous technology, access, economics, didactics, and market. In concluding, Keegan (1996) considered the potential impact of virtual education on the provision of education and the decision-making processes of international planners and government agencies. He stated that it was too early to tell whether the virtual system will be studied as a field of study in its own right or as a subset of distance education.

Simonson et al. (1999) responded to Keegan's (1996) discussion on virtual classrooms by presenting their Equivalency Theory. This theory was developed to provide a theoretical framework specifically for these types of educational

experiences. Their theory was built upon the premise that the learning experience for distance learners should be equivalent to that of local learners. The key elements of their theory were: (a) equivalency, providing experiences with equal value for learners, (b) learning experience, providing a collection of experiences that will be most beneficial for each student or group of students, and (c) appropriate application, providing learning experiences suitable to the needs of the individual learner and the learning situation and that the availability of those experiences should be timely and proper. Simonson et al. identified their theory as uniquely American.

Hanson (1997) supported Schlosser and Anderson's notion that the diverse and changing environment in which distance education is practiced has inhibited the development of a single-all-encompassing theory upon which to found research and practice. He stated that continued change will serve only to further increase the debate regarding these theoretical issues.

Internet/Web Theories of Distance Education

Most recently, work has begun to develop theoretical frameworks related to online distance education. Chen and Willits (1999) modified Moore and Kearsley's (1996) Theory of Transactional Distance and applied it to Web-based videoconferencing. For their study they defined "dialogue" as 'two-way communication between student and teacher and among students that can take the form of synchronous and/or asynchronous verbal and electronic conversation" (p. 47), "structure" as "the extent of rigidity or flexibility in the course organization and in the implementation of videoconferences" (p. 48), and "autonomy" as "the learner's perception of both independent and interdependent participation in a learning activity

and involves both the student's ability to learn individually/self-directedly and his or her preference or need for collaborative learning" (p. 48). From their study they concluded that the concepts of dialogue, structure, and autonomy are not simple, but complex ideas in a videoconferencing class context. Chen and Willits suggested that dialogue needed to be examined in three separate dimensions: in-class discussion, out-of-class, face-to-face interaction, and out-of-class electronic communication. They further proposed that structure needed to be differentiated into the factors of course organization and course delivery and that autonomy needed to be examined in terms of independence and interdependence.

It is heartening to see theoretical work related to C-MODE beginning. It is also important that this work continues and that new theories of C-MODE consider possible differences related to educational level.

Media and Learning

Two major viewpoints on the overall impact of technological media on student learning are represented in the literature. Clark (1983, 1994) believes that most instructional media used in education, while useful tools, have little direct impact on learning. He contends that it is the instructional methodology, content, and involvement of the student that influence learning.

The second point of view, largely expressed by Kozma (1991, 1994), supports the notion that the educational impact of media must be reevaluated, particularly in light of the emergence of a computer-mediated multimedia approach which brings together various instructional media into a single instructional environment. He also

contends that the emergence of hypertext, commonly associated with multimedia learning environments, serves to further support the need to reevaluate the impact of media.

Although Maushak (1997) contends that Clark's position is the generally accepted one, this area of investigation has produced no definitive answer to the question of the impact of various media on learning, nor specific answers regarding the effect on learning of the computer-mediated, online format. Until we have clearer answers to these questions, we must continue to ensure that students receive the benefits implicit in current instructional strategies, while at the same time exploring and testing new approaches.

Computer-Mediated Communication Technologies

Computer-mediated communication features the use of computer conferencing, electronic mail, computer networks, and online database access (Goodyear, 1993). These technological communication capabilities have existed in varying degrees of availability for some time. However, it is the emergence of the Internet, particularly the World Wide Web component, that has resulted in the widespread use of computer-mediated communication in the delivery of distance education. In addition to the features that Goodyear detailed, which were originally supported by exclusively text-based interfaces, the Web allows a broader range of multimedia communication components (Khan, 1997).

The Internet is a network of networks that has the capacity to use a variety of line connections to link computers all over the world (Locatis & Weisberg, 1997).

Varieties of information distribution and retrieval services are available over the Internet, including: electronic mail (e-mail), ftp, gopher, telnet, newsgroups, and the World Wide Web (Khan, 1997; Locatis and Weisberg, 1997). These services allow users to access databases, send messages, exchange files, and search for information (Khan; Locatis & Weisberg). Chat rooms are used for direct text based communication between individuals (Khan). Internet phone is used for direct, oral communication between individuals (Khan). MUDs (multiuser dungeons or domains) or MOOs (multiuser, object-oriented domains) are also used by individuals to interact directly with others in text or visual, virtual reality settings (Fanderclai, 1995; Khan, 1997; Negroponte, 1995; Turkle, 1995). In addition, video-conferencing (Fetterman, 1996; Tiene, 1997) and audio- or video-streaming (Khan) are used to provide face-to-face communication and to deliver instruction and content. The World Wide Web is gradually consolidating all of these services, and because of this and the fact that it is a multimedia-based format, the Web has become the principal Internet vehicle for distance education delivery at all levels.

It is this capacity of the Web to facilitate synchronous and asynchronous communication and instructional delivery in a variety of media that may propel it into the forefront of distance education delivery formats at all academic levels. Educators at the elementary level have long been sensitive to the need to provide learning experiences that respond to differences in learning style and address specific intelligences (Gardner, 1983, 1991). The many options computer-mediated communication affords may well address these needs more effectively than any other distance education format.

Perceived Benefits

Technological Benefits

The Internet is seen as having certain attributes that make it a preferred media for the delivery of educational experiences. It brings together the technologies and related benefits of a number of individual media (Kozma, 1991; Owston, 1997; Tiene, 1997). It allows for both centralized and decentralized information flow and centralized or distributed learning (Locatis & Weisberg, 1997). The Internet is not platform specific (Locatis & Weisberg) and provides open technical standards (Owston). It provides worldwide uniformity and allows global accessibility (Khan, 1997). The wide distribution of millions of Internet-ready computers in hundreds of countries around the world provides an existing base of individuals with access (Barron & Lyskawa, 1998; Locatis & Weisberg).

The arguments that these authors present concerning possible technological advantages seem to indicate that there is sufficient critical mass of standardized technologies available to students around the world to sustain widespread implementation of C-MODE programs at a variety of academic levels. However, we must not fail to recognize that the number of students who are in a position to participate in and benefit from the technological attributes of this format is vastly outweighed by a formidable number of students who have no access at all to information technology, let alone the World Wide Web. Even when economies of scale allow the purchase of the necessary home equipment, students may find that they live in a country that does not have a sufficient infrastructure to allow them sustained, immediate access. As educators, we should consider whether we have a

role in guarding against this becoming an elitist, economically driven practice which either intentionally or unintentionally further serves to exclude disadvantaged individuals and groups around the world.

Cost Benefits

Many believe online distance education provides cost savings over conventional education or other distance education delivery formats (Hawkes et al., 1998; Locatis & Weisberg, 1997; Mortera-Guitierez, 1998). Barron and Lyskawa (1998) believe that the cost to universities to deliver Internet-based education is minimal because most would already have the required technology and because software costs are minimal for students.

Whalen and Wright (1999) have been amongst the first to attempt a cost-benefit analysis of Web-based training. In an investigation of a program at Bell Canada, they found that although it had higher fixed costs than classroom-based training, these were offset by lower variable costs, in course delivery. This was attributed to the fact that a larger number of students can participate in the course without incurring significant incremental costs and a reduction in course delivery time. They also pointed out that to date there had been very little reference to Web-based cost-benefit analysis in the literature.

The potential cost benefits or restrictions inherent in this delivery format will probably remain a significant concern for some time. An assumption frequently expressed in the popular press is that economies of scale constantly drive down the cost of information technology. While this may be so for individual computers, it may not apply to the obvious and hidden costs related to supporting a larger technological

infrastructure. As well, at least in the foreseeable future, there are likely to be large numbers of individuals around the world who will never be able to afford the initial cost of the equipment and the online support costs necessary to participate. An examination of current and projected costs for a variety of distance education formats would seem like a worthwhile undertaking.

Educational Benefits

Distance education has been seen as having the same educational potential for students as instruction in a more traditional format (Schlosser & Anderson, 1994). Schlosser and Anderson further suggest that the factors that determine learning in a distance education setting are no different from those for traditional students.

The Internet is viewed as providing a broader range of general benefits than other distance education technologies. A primary educational benefit of education via the Web is seen as the flexibility that it affords (Barron & Lyskawa, 1998; Mortera-Guitierez, 1998; Owston, 1997). Its combined synchronous and asynchronous flexibility places fewer restrictions on when and where instruction or learning must take place (Barron & Lyskawa; Khan, 1997; Locatis & Weisberg, 1997; Mortera-Guitierez; Owston).

Moore and Kearsley (1996) identify several characteristics related to computer conferencing that can be looked upon as benefits. It combines the benefits of writing, which is important in most educational programs, and the flexibility of conversation. It can be a powerful tool in the stimulation of thoughtful and egalitarian group communication and cooperative learning. Written records of discussions are maintained.

Several benefits for students were identified in the literature. It provides access to educational services for a number of groups who customarily would have had difficulty participating in traditional services. These include individuals isolated by geographical barriers or distance (Barron & Lyskawa, 1998; Findley & Findley, 1997), students wishing to participate in specialized courses not offered locally (Findley & Findley; Layton, 1997; Owston, 1997), nontraditional participants such as adult learners (Findley & Findley), homebound individuals (Findley and Findley, 1997), and those unable to attend school because of cultural, economic, or social barriers (Owston).

Many other educational benefits for students are presented in the literature. It allows learners to access vast amounts of information or experts (Barron & Lyskawa, 1998; Locatis & Weisberg, 1997; Owston, 1997). It causes the learner to assume greater responsibility for his or her learning (Locatis & Weisberg). It allows greater individualization of instruction (Locatis & Weisberg; Saskatchewan School Trustees Association [SSTA], 1995; Tiene, 1997). It allows users to interact in a variety of different ways (Locatis & Weisberg; Owston; Powers, 1997; Tiene), some of which, video-conferencing for example, are seen as being much more personalized than other forms of distance education (Tiene). Another potential educational benefit of the use of online distance education is the ability to bring together students from a wide range of different backgrounds from all over the world into learning groups (Khan, 1997; Layton, 1997).

The use of the Internet is also seen as benefiting instructors. It allows them to alter their role from primarily being deliverers of instruction to being individuals who

create learning experiences or guides (Owston, 1997). Lessons can be revised and improved over time and used repeatedly by students (Tiene, 1997). It facilitates easier course updating and maintenance, and the presence of the Web permits instructors to access information in any field (Barron & Lyskawa, 1998).

Other ancillary benefits that relate to online distance education have been identified. Locatis and Weisberg (1997) argue that the attributes of the Internet (e.g., flexibility of time and place of instruction, kinds of interactions and individualized instruction) establish conditions for the implementation of a new educational paradigm, as defined by Reinhardt (as cited in Locatis & Weisberg, 1997). Carlson et al (1998) express the opinion that educational institutions can expand market share through Web-based instruction. Barron and Lyskawa (1998) echo a similar view in their observation that there is a worldwide audience for distance education courses.

Mortera-Guitierez (1998) views distance education as a means of enhancing social conditions in Mexico. He explains that the Mexican educational system is viewed as being plural and nationalistic, and as such distance education is seen as a plural and dynamic mode of instruction.

A number of educational benefits have been identified in the literature. These can be broadly categorized into four general areas: benefits to students, benefits to instructors, benefits to the institution offering the program, and benefits to society. None of these benefits were specifically identified as applicable (or not applicable) to the use of C-MODE in an elementary setting.

Potential Disadvantages

A significant weakness of the general and online distance education literature is the relative lack of attention given to examining the potential disadvantages of such practices. Other issues which should be considered in future analysis of potential drawbacks are course development costs and instructor time. For the purposes of this literature review, so few disadvantages were identified that it was decided to group them all together rather than discuss them in the sections to which they were related. This approach serves to draw greater attention to the positions they represent.

Schlough and Bhuripanyo (1998) saw the fact that students need to be constantly self-disciplined as a drawback. This is likely to be more pronounced an issue at the elementary level.

Instructors may have to develop new skills related specifically to teaching at a distance (Tiene, 1997). They may also need to adjust instruction for more independent styles of study (Merkley et al., 1997). Teacher certification and institution accreditation can be a concern when delivering instruction across jurisdictions (Sorenson, 1997).

The technical operational problems that sometimes accompany online use can interfere with the educational experience and lead to frustration for learners and instructors (Mory et al., 1998; Owston, 1997; Pan, 98; Tiene, 1997). Students may not have the technical skills to deal with online work (Schlough & Bhuripanyo, 1998). Institutions may find that they require upgrades to their computer infrastructures (Owston; Tiene).

Although there have been numerous references to the cost benefits, there have also been a number of warnings about disadvantages related to cost. In his exhaustive investigation of the costs and economics of distance education, Rumble (1997) warned that with any distance education program there is a danger of simply transferring costs to the users. This notion is supported by Perraton (2000). Owston (1997) warned that there are often both obvious and hidden costs for institutions providing the program, including a need to regularly upgrade their computer infrastructure, as well as course development costs and operational costs. Sorenson (1997) reminded us that the majority of distance education enterprises need to demonstrate a high degree of fiscal accountability because of the nature of their funding. He suggested that the funding bodies expect to get the most from their funds.

Maushak (1997) reports that scheduling can be a problem where students in classroom settings are being delivered instruction from a distance in a number of different schools at the same time. Instructors and institutions preparing to offer C-MODE should be sensitive to the potential scheduling drawbacks.

There are a number of ethical and intellectual questions that could raise potential contentious questions. Henzel and Miller (as cited in Schlosser & Anderson, 1994) see faculty royalties and intellectual property rights as issues which will need to be addressed. Tiene (1997) also speculated that copyright concerns would become more pronounced. Moore and Rumble (as cited in Schlosser & Anderson) expressed the opinion that the marketing of instructional programming would need to be addressed.

In an examination of distance education at the postsecondary level in Canada, Shale (2000) reviewed a number of issues of concern related to the delivery of courses over the Web. As with other authors already mentioned, copyright and intellectual property rights of the academic and the institution were seen as being even more problematic than those found in the conventional relationship. A number of workload-related factors were seen as issues. Extensive amounts of time are required to prepare courses. The ease of communication can lead to an expectation that instructors are available at any time. Workload assignments need to be structured differently from the traditional credits, courses, or contact hours method. Shale also envisioned considerable impact for teaching staff contracts and collective agreements. By way of example, he points out that an agreement struck between York University and teaching staff contained an assurance not to force the introduction of technology.

Perraton (2000) warned established universities in industrialized nations that although the use of computer technology makes it possible for them to reach out to new audiences, it will also result in changes to their own status and relationships. Much of this change will be initiated by their having to compete with each other, developing corporate universities and agencies for students. Virtual universities are seen as having the potential to enroll and teach students globally using the Internet.

Perraton (2000) also warned about potential drawbacks for developing nations. He pointed out that computer-based education would reach the wealthy or those working in the modern sector and cut out the poor, the unemployed, and the remote. He sees this as affecting women more then men. Second, successful distance education programs in developing countries have never been driven by technology in

the way that computer-based programs have the potential to be. Third, there are cultural, social, and economic risks for developing countries. Finally, there are risks in abandoning older technologies that have proven to be effective, such as radio, when rushing to embrace tomorrow's technologies.

Student Perceptions

The perceptions of students enrolled in C-MODE experiences provide vital feedback for program developers. Many assert that generally students prefer not to learn at a distance, regardless of the delivery methodology, primarily because they miss the direct interaction with their peers before, during to some extent, and after formal classes (Mory et al., 1998; Schlosser & Anderson, 1994; Simonson, 1997).

Schlough and Bhuripanyo (1998) found that 77% of the respondents in their study, given the opportunity to take the distance education course in which they were enrolled over again, would prefer to do so in a classroom. Twenty-two percent indicated they would prefer the Internet. It is interesting to note that it has been suggested that, in spite of this expressed preference for direct education, students are increasingly seeking out and requesting distance learning experiences. (Owston, 1997; Schlosser & Anderson, 1994; Simonson, 1997).

Schlough and Bhuripanyo's (1998) course assessment study conducted with students who were both teachers at a technical college and enrolled in a vocational undergraduate degree program revealed a number of relevant student perceptions. On the positive side, students indicated that the delivery provided a level of convenience because of the degree of freedom it afforded in both time and space, encouraged

individual learning, while at the same time provided group learning activities. It also permitted course members to choose the speed at which they processed course material. The respondents also noted that the delivery methodology allowed students to review one another's opinions in postings and gain fresh insights related to the diverse nature of the student body. They also believed that it provided clear, relevant content, omitting what was felt to be unnecessary, confusing information that was sometimes provided in classroom settings. This group of distance education learners also felt that being able to speak to the professor over the telephone provided a sense of connection.

On the negative side, the Schlough and Bhuripanyo (1998) study found that distance education required students to be self-disciplined and that the delivery was not applicable to all learning styles. Some students who did not work in groups or pairs articulated a feeling of isolation and expressed the opinion that the delivery had the potential to be impersonal. One of the communication software programs used was found confusing to some users.

The respondents in the Schlough and Bhuripanyo (1998) study proposed a number of recommendations to enhance course delivery. They felt it was important for all course participants to be aware of the limitations and nature of the course. More substantial course and software orientation and print-based software instructions should be provided. The software that was found to be deficient should be improved. More group work should be encouraged. The establishment of a chat room was seen as having potential benefits. Midterm and course ending meetings

should be instituted. Students should be required to find relevant course-related Internet sites and report to the class on them.

Mory et al (1998) also found that students identified both positive and negative attributes in online course delivery. Many of their observations were similar to those expressed in the Schlough and Bhuripanyo (1998) study and they saw benefit in being able to read other students' comments and answers in the discussions that took place online. They also found it beneficial to be able to have time to reflect upon what was being said before having to respond to it. Further, the posting of comments and answers provided an ongoing record and accommodated ongoing review of topics and more open pacing.

A significant number of respondents in the Mory et al. (1998) study expressed that there were no opportunities for real-time communication. Individual pacing and effort in trying to keep up with the course schedule was seen as a significant problem. One student expressed the opinion that having all of the online information presented in the form of text and graphics greatly affected the ability to keep up with the course requirements. The opinion was expressed that not all learning styles were being addressed. This was again expressed in relation to the amount of online text reading that was required. The interaction possible in a classroom and participation in the informal discussions that take place outside of the class were missed. Tiene (1997) found that students found it difficult to pay attention, ask questions, contribute to discussions, get assistance, and get to know the teacher when situated at remote sites.

The perceptions expressed by the students relate principally to their own needs, with some additional implications for instructors and institutions. Although

they indicated that they enjoyed many of the benefits associated with C-MODE identified in the literature, they also saw a need for direct, informal gatherings both online and in face-to-face meetings. The desire for these meetings, as well as a desire to work collaboratively, seem to speak to an attempt to address feelings of isolation. The learners' voices should always play a significant role in the assessment of online learning experiences.

Distance Education at the Elementary Level

When elementary distance education is discussed at all in either the general or online distance education literature, it is usually considered in an all-encompassing K-12 context (Berge & Collins, 1998; Cavanaugh, 1999; Fagan, 1997; Hanson, 1997; Maushak & Manternach, 1997; Merkleyet al. 1997; Moore & Kearsley, 1996; Mortera-Guitierez, 1998; Owston, 1997; Schlosser & Anderson, 1994; Wellburn, 1999). Only one group of authors, Ross et al. (1991), attempted to deal with elementary C-MODE as a distinct, separate issue.

Online Distance Education Literature - Elementary

Ross et al. (1991) examined student perceptions in two separate distance education programs that catered to at-risk elementary school-aged children. One of the programs used a local text-based electronic bulletin board. The second used a national network, AppleLink. AppleLink provided teleconferencing as well as e-mail. Students in the first program reacted with mixed feelings or negatively to the process. Generally, they felt they did not receive enough help with their writing skills, did not learn much from their tutors, and found the assignments difficult. Students in the

second program responded more positively to the process. They indicated that they would have enjoyed more online communication and enjoyed a positive relationship with their tutors.

Owston (1997) reported that some experimental online access to education was being conducted at the public school level but that it was not widespread. According to Owston, the three areas in which the Web is providing increased access to education are home schooling, alternative schooling, and extension courses. Home schooling and alternative schooling can be seen as the two areas of application that might most directly affect elementary-aged students.

Cavanaugh's (1999) meta-analysis of studies examining the effectiveness of interactive distance learning technologies on K-12 academic achievement found that there was a small positive effect for interactive distance education. She concluded that K-12 achievement related to distance education could be expected to be at least comparable to traditional instruction. Cavanaugh's study found no significant difference between grade levels. Thus, we can conclude that the slightly positive impact holds true for elementary achievement. This analysis examined 19 studies of which 6 were undertaken with grades 3 to 8. All of the studies involved the delivery of content to students situated in a classroom setting. Two-way audio-visual conferencing was used as the distance education system in 68% of the studies, e-mail in 26%, and the World Wide Web in one study.

General Distance Education Literature--Elementary

Fagan (1997), Maushak and Manternach (1997), and Merkley et al (1997) all reported on findings related to the Iowa Distance Education Alliance project. This

project was initiated with the awarding of a Star Schools grant and was established to demonstrate the use of fibre-optic technology to deliver two-way, full-motion, live, interactive instruction into existing classrooms. In this setting, the instructors were at a distance while the students remained in traditional classroom settings. Fagan found in an assessment study of the implementation of distance education in the state of Iowa that 67% of K-4 teachers, compared to 50% of 9-12 teachers were resistant and had negative attitudes towards the implementation of distance education technologies and their participation in the process. Fagan concluded that teacher grade level, as well as a number of other variables, may affect teacher concerns. Maushak and Manternach reported that elementary schools participated in multimedia curriculum projects. Merkley et al. (1997) reported that 15% of the participants in their study were elementary teachers, but provided no specific references to this group.

Mortera-Guitierez (1998) indicated that distance education is offered in Mexico at the primary education and junior high levels, but provided no specific details. Schlosser and Anderson (1994) observed that as early as 1994, although distance education traditionally meant the involvement of adults, in the U.S. distance learning was increasingly being offered to K-12 students where funding existed. They noted that at that time telecommunications were primarily being used to provide curriculum enrichment in elementary and middle schools.

Criteria for Successful Implementation and Practice

Online Distance Education Literature

Findley and Findley (1997) identified several criteria related to successful C-MODE program implementation and practice. These included: (a) instructor readiness in terms of both the curriculum and the technology is important, (b) students must be able to interact freely and be made to feel like they are part of a learning group and are working closely with their peers, (c) surveys should be conducted before a course begins to gain an understanding of student knowledge and skill levels, (d) Individual and group learning experiences must be provided, (e) experts should be used as course resources, (f) feedback to students must be ongoing rather than exclusively at grading periods, (g) the technology must be kept in superior operational condition, (h) policies concerning use of the technology must be established, (i) the instructors must continually evaluate the program and students must be allowed input, and (j) the curriculum and educators, and not the technology, must drive the program.

Mory et al. (1998) offered a number of recommendations for planning web-based instruction: (a) provide a variety of presentation formats using a variety of media, including images of the instructor and students if possible, (b) adequate technical support for both students and instructors must be provided, (c) instructors should provide opportunities for students to express their reactions to the course as a means of obtaining data on how students are handling the course workload, (d) instructors should make adjustments to course workload during the course if

necessary, (e) a detailed course outline should be provided for students, and (f) external clues and deadlines must be established to help students keep on track.

Everett (1998) suggested a number of techniques for instructors to enhance instruction in a compressed video environment: (a) instructors should have training in dealing with student fears, apprehensions, and coping mechanisms that they tend to exhibit in the first few days of an online course, (b) approval to offer online courses should not be given to instructors until they have demonstrated that they can adapt their course to an online setting, (c) instructors need to assist students to make sense of and adapt to the distance learning technology, (d) a variety of teaching methods is recommended, (e) instructors need to learn and implement new technologies in their instructional practices, and (f) instructors will need to modify teaching methods, course material, and technologies based upon student feelings and coping mechanisms.

Meyer-Peyton (2000) outlined several elements of a successful program based upon experiences with the U.S. Department of Defense Education Activity Electronic School: (a) the program should have a clear plan, (b) the delivery platform should enable the implementation of the course goals and structure, (c) the equipment and infrastructure should be reliable and robust, (d) technical support should be immediate when problems occur, (e) the instructors should be dedicated to the concept of distributed learning, (f) the instructors should be versed in distributed learning pedagogy, (g) the instructors should be comfortable with the technology, (h) the instructional model should incorporate a variety of techniques, (i) local personnel

should be used to assist with on-site facilitating and support, and (j) the program should be constantly monitored and evaluated for effectiveness.

Schrum (2000) delineated characteristics of successful students in online learning and several pedagogical, organizational, and institutional issues that must be considered before offering an online course. According to Schrum students identified themselves as being successful when: (a) they began with a certain level of technological experience and knowledge, (b) they had support from their families, (c) they had strong reasons for signing up for the course, (d) they moved through the lessons quickly, and (e) they were independent learners.

According to Schrum (2000), pedagogical considerations included: (a) the establishment of pedagogical goals for the course, (b) ensuring that active and independent learning takes place, (c) creating a course development team, (d) instructors giving themselves permission to work through a process of trial and error, (e) ensuring that evaluation is continual and ongoing, and (f) allowing students to provide feedback several times during a term regarding progress of the course. Schrum also stated that certain organizational decisions must be made prior to the commencement of the course, including: (a) what portion of the course should be delivered online and what portion, if any, delivered through other means, (b) what types of assignments should be included, (c) what interactions should take place and how should they take place, (d) what will be the group size, and (e) what prerequisite skills will the students require? Other organizational considerations presented included: (f) providing students with readings, assignments, and expectations at the beginning of the course, (g) ensuring that the course is well organized, (h) organizing

introductory activities which are appropriate for both novices and experts, (i) fostering collegial interaction, and (j) establishing rules for the use of the online environment.

Schrum (2000) also proposed several institutional issues. These included: (a) recognition of faculty and those assisting, (b) providing time to instructors for course design and development, (c) determining who will bear the expense of online courses, (d) deciding whether technology should be loaned to students who cannot afford it, (e) examining how distant students will access materials located on the campus, and (f) establishing an evaluative component for every course.

General Distance Education Literature

A number of general criteria for successful implementation and practice have also been proposed concerning other forms of distance education that may have implications for C-MODE. Schlosser and Anderson (1994) identified a number of criteria as being significant to successful implementation or practice. They believe: (a) from a management point-of-view, distance education enterprises require a high degree of planning, management control and excellent communications, (b) teachers must be certified to teach at the appropriate grade level, qualified to teach particular content, and be trained in distance education practices, (c) students must be able to readily access the instructor and interact with fellow students and the instructor, (d) students must be provided with opportunities to participate in the ongoing evaluation of their own progress as well as that of the program in which they are enrolled, and (d) development of course materials is viewed as critical.

Verduin and Clark (1991) proposed the use of a team approach. They recommended that the team include content specialists, instructional designers, media specialists, as well as writers and editors. They further recommended that students be allowed to participate in the program evaluation process as well as their own progress. Perraton (1988) suggested: (a) the use of a multi-media format is more effective than the use of a single medium, (b) feedback was seen as an essential component of a distance learning system, (c) a systems approach to planning distance education was also preferred, and (d) distance-teaching, he argued, should involve students participating in regular and frequent activities above and beyond listening, watching or reading. Miller (as cited in Schlosser & Anderson, 1994) reiterated the point made by Findley and Findley (1997) that the curriculum and educators, and not the technology, must drive the program. Moore and Graf (as cited in Schlosser & Anderson, 1994) suggested that course design and curriculum development are critical in any distance education setting.

Sorenson (1997) indicated: (a) students, instructors, and support staff need to work in concert to produce quality distance education programming, (b) teachers need to change their method of teaching and devote more attention to student interaction, visual materials, activities for independent study, advanced preparation, and follow up activities, (c) teacher certification for the appropriate grade level was seen as important, (d) teachers should have appropriate qualifications for specific subjects and training in distance education practices, (e) support personnel were seen to provide a vital link between students and teachers, as was having a well-trained,

technological staff, and (f) intellectual property rights and royalties need to be addressed.

Additional criteria suggested by other authors are also identified in the Sorenson (1997) literature review. A number of authors and sources (Cyrs & Smith; Graf; U.S. Congress, as cited in Sorenson) stated that distance teachers require additional planning time and that distance teaching places increased demands on their time. Moore (as cited in Sorenson) suggested: (a) administrative support to instructors reflects a commitment to the importance of efforts to become effective distance educators must be provided, (b) he further suggested that this can be accomplished by salary and time allocations, assurances of job security and by involving teachers in the planning and decision making process, (c) students benefit from being informed about the instructor's expectations and rules and procedures for the distance class, and (d) support systems that have been properly designed and maintained were seen as essential for successful distance education enterprises. Moore and others (Rumble; U.S. Congress, as cited in Sorenson) believe that it is necessary to provide counseling services that meet the needs of distance learners because of the potential for heightened feelings of separation when problems occur.

A report prepared by the Saskatchewan School Trustees Association (1995) raised a number of questions concerning distribution logistics: Should distance education be delivered from a number of locations or centralized; and should a single provincial timetable for course offerings be established? In The Ohio SchoolNet Telecommunity Evaluation report, Hawkes, Cambre, and Lewis (1998) identified four domains of criteria that he considered important when attempting to distinguish

successful distance education practice: technical, instructional, organizational, and ethical. Technical criteria are those associated with equipment specifications and performance; instructional criteria are those associated with the delivery and access of instruction and outcomes for the learners; organizational criteria concern the day-to-day aspects of the technology, support mechanisms, and training required to sustain its use; ethical criteria are seen as addressing the availability of the technology to diverse learning audiences. He also noted that policies concerning use of the technology must be established.

A number of other authors presented additional criteria or reiterated criteria already mentioned by authors cited above in both sections of the literature examined. McKenzie, Kirby, Newbill, and Davidson (1998) in their own survey related to the development of a set of guidelines for effective distance instruction identified a broad range of teaching behaviours which were seen as significant to the successful practice of distance education. These were categorized into management, instructional, technical, and assessment categories. Simonson (1997) saw successful implementation of distance education into mainstream education as being contingent upon the ability of educators to provide students with equivalent learning experiences no matter whether they attend a class in person or participate in an online class from a distance. Students, he said, must be able to interact freely.

Jegede and Kirkwood (1994) found in their study of distance education students enrolled at the University of Southern Queensland that anxiety in distance education learners may play a higher role in attrition than was previously believed. The course delivery methodology was not indicated in their report.

In summary, the online and broader distance education literature suggests that there are five general areas that must be addressed when considering criteria for successful implementation and practice. They are organization, program, instructor, student, and technical. This expands upon and modifies the framework proposed by Hawkes et al. (1998).

Broadly examining the criteria identified under each of the five individual areas, we can make the following general statements about each. Organizations must provide support to students and organizational members. They must ensure that a high degree of planning is applied to all aspects of the program they offer. The curriculum and the instructors, not the technology, must drive the program. It must be constantly evaluated, with all parties having a voice. Instructors must be thoroughly prepared in all areas. They must remain adaptive and open. Students must be provided with opportunities to interact freely in a number of different ways with their peers and instructors. They must be made to feel as though they are part of a group and not isolated and forced constantly to work independently. The technology must be kept in working order, and it must remain secondary to the educational experience.

Although none of the authors reviewed examined criteria in terms of how they apply to the elementary level, many of the criteria they identified may be seen as relevant to that level. At the very least, they offer a point of departure for investigation in that area.

Summary of Literature Reviewed

Criticisms

There are a number of general criticisms that must be stated concerning the literature reviewed. As previously stated, there is a general lack of attention to the possible disadvantages of distance education in any form. To offer a complete and thoughtful examination of C-MODE we must fully present all of the possible ramifications. It is hoped that some of the questions that were posed or issues identified in this review will contribute to that effort.

A second criticism is the lack of attention given to discussing distance education at the elementary level. This was particularly unsettling in light of the fact that a number of authors acknowledged that it was being undertaken but did not include it to any great extent in their discussions.

Finally, there were a number of papers that appeared to strongly reflect the personal biases of the authors. As we continue our study of this new phenomenon, it is essential that, as much as possible, we maintain an unbiased and balanced perspective.

Summary of Guidelines for Effective Implementation and Practice

The literature reviewed, although limited in how it has addressed elementary distance education in general, and especially in terms of how it has addressed C-MODE, provides us with some insights that may be applied to the elementary level. However, we must remain cognizant of the fact that this literature provides only a point of departure to begin the broader examination of the application of C-MODE at the elementary level. As Schlosser and Anderson (1994) point out, "much of the

research in distance education has involved adult, off-campus college students, as well as highly motivated college-bound high school students. Conclusions reached with such populations may not generalize well to other populations" (p. 27). It may ultimately be found not to be applicable to the study area.

The initial framework for guidelines relating to the effective implementation and practice of C-MODE at the elementary level is largely based upon those criteria identified by authors as significant in other academic levels and in different distance education formats.

Consideration was given to using the criteria framework suggested by Hawkes et al. (1998), namely technical, instructional, organizational, and ethical. However, as previously suggested, the broader literature seems to speak to five general areas that must be addressed when considering criteria for successful implementation. They are program, instructor, student, organizational, and technical. The importance of the role of the instructor and the students seems to necessitate examining them as separate issues. For the purpose of this study, the term "instructor" refers to the individual in the employ of the educational institution operating the C-MODE program, and not any individual who may be assisting a student at home. Since ethical questions apply to all areas of organizational philosophy and operation, they will be dealt with under the broader organizational consideration.

Program.

- Course design and curriculum development are critical.
- Clear goals for the program must be established.

- A team approach should be used to develop course materials, including content specialists, instructional designers, media specialists, as well as writers and editors.
- Students, instructors, and support staff need to work in concert to produce quality distance education programming.
- The program must be continually evaluated by the instructors.
- Participating students must be allowed input in the program evaluation process.
- The curriculum and educators, and not the technology, must drive the program.
- Program developers need to recognize that the factors that determine learning in a distance education setting are no different than those for traditional settings.
- A variety of presentation formats using a variety of media should be used.
- Detailed course outlines should be provided for students.
- Clear, relevant content should be provided.
- Experts should be used as course resources.
- External clues and deadlines must be established to help students keep ontrack.
- Attention to convenience in the degree of freedom afforded in both time and space should be provided.
- Both individual and group learning experiences must be provided.
- A wide variety of teaching methods should be used.
- Attempts must be made to accommodate all learning styles.
- Program developers should capitalize on the inherent ability to allow greater individualization of instruction.

- Introductory, midterm and term ending face-to-face meetings should be provided where possible.
- Feedback to students must be ongoing rather than exclusively at grading periods.
- Postings of comments and answers should be available in an online archive for ongoing review by students and instructors.
- Images of the instructor and students should be provided if possible.
- Substantial program orientation must be provided.
- The program must provide at least an equivalent learning experience to being in a classroom setting.

Instructors.

- Instructor readiness, with both the curriculum and the technology, is important.
- The instructors' role is changed from primarily being deliverers, of instruction to individuals who create learning experiences or guides.
- Distance teachers require additional planning time.
- Distance teaching places increased demands on instructors' time.
- Instructors may be required to develop a new set of related skills.
- Instructors must be certified to teach at the appropriate grade level.
- Instructors must be qualified to teach particular content.
- Instructors must be dedicated to the concept of distance education.
- Instructors must be trained in distance education practices.
- Approval to offer online courses should not be given to instructors until they have demonstrated that they can adapt their teaching to an online setting.

- Teaching at a distance would allow teachers to be hired from jurisdictions in which they may not reside.
- Instructors should modify teaching methods, course material, and technologies based upon student feelings and coping mechanisms.
- Instructors may require training in dealing with student fears, apprehensions and coping mechanisms related to C-MODE.
- Instructors need to assist students to make sense of and adapt to the distance learning technology.
- Instructors may need to make adjustments to course workload during the course if necessary.

Students.

- Students may not have the immediate technical skills to deal with online work.
- Students must have opportunities for direct, informal interaction with their peers.
- Students require opportunities for individual learning as well as group learning activities.
- Students must be allowed some flexibility in the speed at which they proceed with course material.
- Students must be able to communicate readily and directly with the instructor.
- Students will need to develop the ability to be self-disciplined.
- Students may feel isolated from time to time.
- Students must be able to interact freely with their peers.
- Students must be made to feel like they are part of a learning group and are working closely with their peers.

- Students must be provided with opportunities for real-time communication with peers.
- Students must be provided with opportunities for real-time communication with instructors.
- Students must be provided with opportunities to participate in the ongoing evaluation of their own progress.
- Students must be provided with opportunities to participate in the ongoing evaluation of the program in which they are enrolled.
- Students need to participate in regular and frequent activities above and beyond listening, watching, or reading.
- Students benefit from the ability to interact with students from a wide range of different backgrounds.
- Some students may find it difficult to pay attention, ask questions, contribute to discussions, get assistance, and get to know the teacher.
- Students need opportunities to express their reactions to the program.
- The technical, operational problems that sometimes accompany online use can interfere with the educational experience and lead to frustration for learners.
- Students should have the support of their families.

Organization.

- A high degree of planning is required.
- A systems approach is helpful in planning.
- High degree of management control is required.
- Excellent communication channels must be established.

- Properly designed and maintained support systems must be established.
- Support personnel provide a vital link between students and teachers.
- Intellectual property rights and royalties need to be addressed.
- Policies concerning use of the technology must be established.
- Policies concerning copyright concerns must be established.
- Policies concerning ethical issues must be established.
- Policies concerning social issues must be established where deemed necessary.
- The organization needs to recognize that scheduling may be a problem where students in different locations (time zones) are being delivered instruction at the same time.
- Assessments should be conducted with new learners to gain an understanding of student knowledge and skill levels.
- Be aware there are often hidden costs for institutions providing the program.
- Monitor operational cost closely to determine true costs.
- Distance education enterprises need to demonstrate a high degree of fiscal accountability.
- Be aware that ongoing upgrades to computer infrastructures may be required.
- Be aware that market share can be expanded beyond traditional areas through Web-based instruction.
- Organizations offering online learning experience must recognize that C-MODE may actually be detrimental to learning for some individuals.
- Be aware that students are increasingly seeking out and requesting distance learning experiences.

- Organizations should be sensitive to the fact that the technical, operational problems that sometimes accompany online use can interfere with the educational experience and lead to frustration for instructors.
- Administrative support must be provided to instructors that reflects a commitment to the importance of efforts to become effective distance educators.
- Administrative commitment to instructors can be accomplished in part by salary.
- Administrative commitment to instructors can be accomplished in part by time allocations.
- Administrative commitment to instructors can be accomplished in part by assurances of job security.
- Administrative commitment to instructors can be accomplished in part by involving teachers in the planning and decision-making process.
- Provide counseling services that meet the needs of distance learners.

Technical.

- The technology must be kept in superior operational condition.
- Having a well-trained technological staff is essential.
- Adequate technical support for both students and instructors must be provided.
- Avoid attempting to be platform specific.
- Use open technical standards.
- Use technologies which allow the use of a number of different, individual media.
- Use technologies which allow for both centralized and decentralized information flow.

- Use technologies which allow for both centralized and distributed learning.
- Print based technical instructions should be provided.
- Substantial software orientation must be provided.

Upon reviewing the above criteria, one will almost immediately notice that there is overlap of criteria stated in the five general areas. For example, providing students with an opportunity for input in the program evaluation process is stated as criteria under both the Program and Student areas. This was done because the impact is different in each case. If program developers solicit and receive student feedback that is used to constructively modify the program, then the program and ultimately the entire student body benefit. The ability for the individual student to provide feedback may immediately benefit that individual because he or she has had the opportunity to express his or her thoughts and probably feels included in the process and validated by the experience, whether or not his or her suggestions are reflected in changes to the program.

Other criteria may seem intuitively obvious or unnecessary to the reader. In establishing these criteria, the author has not attempted to judge their value to the discussion. They have simply been directly stated, summarized, or extrapolated from the literature. Only occasional, minor contextual modifications have been made. One of the two main purposes of this study is to identify an initial framework for guidelines relating to the effective implementation and practice of computer-mediated, online distance education at the elementary level. Whether the specific criteria identified in these guidelines are applicable to the elementary setting will be tested in this study.

CHAPTER THREE: METHODOLOGY AND PROCEDURES

Overview

Chapter Three provides a description of the research methodology used in this study. It includes an examination of the research method, research design, participant selection, instrumentation, data collection and recording, data analysis, methodological assumptions and limitations, and ethical considerations.

Description of Research Methodology

This study was nonexperimental, exploratory, and descriptive in nature. The research approach used was the descriptive survey method. One of the purposes of this study was to identify guidelines that could be used by practitioners to improve practice. As such, this study must also be seen in part as action-based research.

Quantitative and qualitative data were collected using a survey questionnaire that was developed as a secondary purpose of the project. Survey research is seen as an effective means of determining attitudes or opinions of a group or population towards issues or information (Fraenkel & Wallen, 1996; Mason & Bramble, 1997; McMillan & Schumacher, 1997). McMillan and Schumacher's approach to survey research was used as the primary theoretical basis for this investigation.

Research Design

In this study, the dependent variables are the responses to the 101 identified individual statements and the aggregate responses to the five criteria categories. The

independent variables are Employee Group (administrator, instructor, other), Program Has Been in Operation For, hereafter referred to as Years of Program Operation, (1 year or less, 2 years, 3 years, more than 3 years), Gender (male, female), Participants Years of Experience Practicing/Directing Online Distance Education, hereafter referred to as Years of Experience, (1, 2, 3, 4, 5, more than 5 years), Educational Sector (public, private), and Country of Practice (Canada, U.S.A.). It was hypothesized that there would be no significant differences between the means of the responses from the various independent variable groups.

Pilot Study

A pilot study was undertaken with practitioners of C-MODE at the postsecondary level to validate and provide suggestions for improvement to the survey instrument. This group was used for two reasons: (a) Because of the relatively limited number of elementary practitioners in the study field it was believed that asking elementary practitioners to participate in a pilot study would further reduce the potential number of participants for the study itself, and (b) the statements used in the instrument were derived from postsecondary practice.

Nineteen individuals volunteered to participate in the pilot study. Participants were solicited by sending an e-mail communication (Appendix D) request to all of the deans of Faculties of Education at Canadian English-speaking or bilingual universities. The deans were asked to forward the e-mail, which contained information concerning the project, to faculty members who had been involved in computer-mediated online distance education. A number of faculty members were

contacted directly by e-mail communication (Appendix E). This was done when no responses were received from a university and where individual faculty members were identified on the faculty web-site as being practitioners of online education. The dean of the Faculty of Education at Brock University was not contacted. It was decided that full-time faculty members at the university hosting the project would not be asked to participate in the pilot study.

Pilot study participants were mailed copies of the pilot survey instrument (Appendix A), the pilot study letter of information (Appendix B), and the pilot study informed consent form (Appendix C). They were asked to complete the survey questionnaire based on their opinions related to the practice of C-MODE at the postsecondary level, not the elementary level. They were also asked to provide comments concerning: (a) specific statements contained within the instrument, (b) additional statements that they believed should be included, or (c) the entire instrument. Eighteen of the participants completed the survey. One participant did not complete the survey, but provided comments.

The pilot study revealed that the questionnaire was a reliable survey instrument. A Cronbach's Alpha reliability coefficient of .96 was established for the survey. Cronbach's Alpha is considered the most appropriate reliability measure for questionnaires and survey research (McMillan & Schumacher, 1997). A value of .70 or higher is considered acceptable (Litman, 1995; Nunnaly, 1978) to establish reliability.

Qualitative data from participants, and the researcher's observations, were used to make minor modifications to the survey instrument. These included, amongst

others, clarifying aspects of the Respondent and Program Information and Program Guidelines sections.

Clarification and modification of the Respondent and Program Information section included: (a) separating the explanatory statement and participant completion section on to separate pages, (b) eliminating the number of students being taught at each grade level variable, and (c) adding participant's years of experience as a variable, modifying the levels embodied in the years the program has been in operation variable, and adding wording to the directions for many variables. Clarification of the Program Guidelines section included: (a) the renaming of the section "Program and Course Guidelines", (b) grouping program and course statements separately within the new section, and (c) ensuring the statements clearly indicated which of the two was being referred to.

Other modifications implicitly or explicitly suggested and incorporated into the revised instrument included: (a) the elimination of two statements, (b) the addition of one statement, (c) the separating of each of six statements into two individual ones, and (d) the clarification of statement wording in all sections. The original survey instrument used in the pilot study contained seven respondent and program variables and 96 statements, whereas the modified version used in the study contained seven respondent and program variables and 101 statements.

Study Participant Selection

The subjects were 16 administrators and instructors. Survey responses were solicited from individuals involved in the development, administration, and/or delivery of C-MODE at the elementary level.

Comprehensive sampling (McMillan & Schumacher, 1997) was undertaken by selecting participants on a voluntary basis. Participants were gathered by sending online e-mail solicitations and direct mailing solicitations to educational programs which offered online education at the elementary level. Online programs were identified by searching on the Internet for their web-sites using conventional search engines such as Google, Yahoo, Hotbot, and Webcrawler.

Network or snowball sampling (McMillan & Schumacher, 1997) was also employed to maximize the number of participants. The e-mail and direct mailing solicitations asked potential participants to suggest other elementary C-MODE programs not identified by the researcher.

Instrumentation

A survey instrument was developed to investigate the beliefs and attitudes of elementary C-MODE practitioners about what constitutes effective implementation and practice principles in this field. The statements included in the pilot and study questionnaires (Appendixes A and F) were developed using a modified version of the Dean (1997) six step Evaluation Criterion Validation Model. The six steps followed in this model include: (a) identification of stakeholders, (b) identification of potential

evaluation criteria, (c) development of the survey instrument, (d) collection of data, (e) analysis of data, and (f) selection of criterion set.

The evaluation criteria identified as being important in the delivery of C-MODE courses at the postsecondary level were used to form the basis of the instrument statements. These were determined by reviewing the current body of literature reporting research findings and anecdotal observations. They were grouped into five relevant categories, namely Program and Course Guidelines, Instructor Guidelines, Student Guidelines, Organizational Guidelines, and Technical Guidelines. As previously stated, the original instrument was modified slightly based upon data collected in the pilot study.

Respondents were asked to provide information about themselves and the program in which they worked. Participants were asked to rate 101 individual criteria statements on a 5 point Likert scale with a point range that included the values: 1 (Strongly Disagree), 2 (Disagree), 3 (Neutral or Undecided), 4 (Agree), 5 (Strongly Agree). Qualitative data were collected by asking respondents to comment on the individual statements or to suggest other statements they considered important.

The questionnaire preserved participant anonymity and confidentiality. This was accomplished by not requesting names.

As with the pilot study, a Cronbach's Alpha reliability test was undertaken. A Cronbach's Alpha reliability coefficient of .85 was established for the study survey instrument. Thus, it can be seen as a reliable survey instrument.

Data Collection and Recording

The survey was administered in June and September 2001. In June, e-mail solicitations (Appendix I) were sent to administrators identified on program web-sites, and where no administrator was identified, to the general contact e-mail address. This process produced only 2 participants.

As a result of the limited number of responses to e-mail contact, a direct mail approach was undertaken. Between September 6, 2001 and September 13, 2001 survey packages were mailed to individuals at 24 boards of education or institutions identified as offering elementary C-MODE programs located in Canada and the United States. The packages included a copy of the survey instrument (Appendix F), an informed consent form (Appendix H), the letter of information (Appendix G), and a self-addressed stamped envelope in which to return the questionnaire to the researcher after it had been completed.

Where only administrator's names were posted on program web-sites they were sent five survey kits and asked in a personalized covering letter (Appendix J) to complete one themselves and distribute the rest to employees. At sites where individual instructors or additional employees were listed, these individuals were contacted directly along with administrators. Where no names were listed, five survey packages were sent to the program contact address requesting in a general covering letter (Appendix K) that survey packages be distributed to employees. At the completion of the project a copy of the study feedback letter (Appendix L) was sent to all pilot and study participants.

Data Processing and Analysis

The quantitative data were analyzed using the Statistical Package for the Social Sciences (SPSS). Analysis included the following:

- Frequency counts on Respondent and Program demographics
- Frequency counts, means, and standard deviations for all dependent variables
- t tests to determine whether any significant associations existed between survey responses and Gender, Years of Experience, and Employee Group

Qualitative data were analyzed using standard qualitative coding and categorizing methods (Denzin & Lincoln, 1994; Glesne & Peshkin, 1992; Lincoln & Guba, 1985; McMillan & Schumaker, 1997).

Methodological Assumptions and Limitations

The purpose of this study was to identify criteria applicable to the successful implementation and practice of computer-mediated online distance education at the elementary level as perceived by administrators, instructors, and others involved in the delivery of such programs. No attempt was made to seek causal relationships among or between variables.

This study was undertaken with practitioners in English-speaking programs based in Canada and the United States who voluntarily responded to the survey. No attempt was made to generalize the findings to programs based in other languages or at other academic levels.

Ethical Considerations

All aspects of this study were guided by the Brock University Principles of Ethical Research with Human Participants as outlined in the Brock University Faculty Handbook. Participants were advised about these guidelines and provided with information that would allow access to them. Before data collection began, ethical approval (Appendix Q) was obtained from Brock University.

No attempt was made to obtain ethical approval from each of the programs contacted. One local ethical approval was requested before participants could be allowed to participate in the pilot study. This was undertaken as required.

The e-mail and direct mail solicitations sent to potential participants advised them of the purpose of the study, the procedure for completing the questionnaire online, the time requirements involved, and how the results would be reported to them. Further, they were advised of the ethical considerations, as outlined above, the voluntary nature of the study, and the procedures taken to ensure confidentiality.

Restatement of the Research Purpose

This study had three major areas of focus related to the effective implementation and practice of computer-mediated online distance education at the elementary level. It sought: to identify a preliminary framework of guidelines for effective implementation and practice, to identify additional areas for which guidelines should be developed, and to develop a questionnaire that sought feedback on their appropriateness. The first version of the instrument was piloted with postsecondary instructors. The second draft of the instrument was used to survey

individuals currently involved in the delivery of computer-mediated online distance education at the elementary level. Participants were asked to express their opinions concerning the validity of the criteria identified in the questionnaire. Results from the survey were used to further refine the instrument.

Summary of Chapter

Chapter Three outlined the research design and resultant methodology to be used for this study. This included an examination of the development of the survey instrument, the pilot study, participant identification and selection, data collection and analysis, study limitations, and the guiding ethical considerations.

CHAPTER FOUR: FINDINGS

Overview

Chapter Four examines the results of the study as they pertain to the research purpose. Response patterns to the 101 dependent variables, hereafter referred to as survey statements or statements, and to the five guideline categories (Program and Course, Instructor, Student, Organizational, and Technical) are presented and interpreted. To facilitate reading, the Program and Course category is referred to as Program. The chapter also examines the relationship of three independent variables to the survey statements to determine if any significant relationships exist.

Participant and Program Profiles

As outlined in Chapter Three, demographics were collected concerning individual participants and the programs in which these individuals worked. These were used to construct the following profiles.

Participants Profiles

Participants in the study were 16 individuals involved in the development, delivery, or administration of C-MODE at the elementary level. Three individuals identified themselves as members of the "Administrator" employee group, eleven identified themselves as members of the "Instructor/Teacher" group, and two identified themselves as members of "Other." One of the "Other" group members was regrouped into the "Instructor/Teacher" group because the participant described themself as a mentor. The second individual who identified him/herself as a member of the "Other" group was regrouped into the "Administrator" employee group because

the job description that was provided by the participant indicated he/she was a member of the senior management team. Consequently, there were 4 participants classified as Administrator and 12 as Teacher/Instructor.

The sample included a relatively equal representation of both genders. Nine males and 7 females completed and returned the survey. No attempt was made to determine whether these numbers represented the actual proportion of men and women involved in C-MODE at the elementary level.

Examination of the years of experience participants had in practicing or directing online distance education revealed that 9 individuals had between 1 and 3 years experience and 7 individuals had 4 or more years of experience. For the purposes of this study those reporting between 1 and 3 years experience were identified as new or inexperienced practitioners, and those with 4 or more years were identified as experienced practitioners.

Program Profiles

Thirteen of the participants indicated that the programs in which they worked had been in operation for more than 3 years. Two had been operated for 3 years and one for just 1 year.

Thirteen of the participants worked in public sector programs and 3 were from private sector programs. Twelve were from Canada and 4 were from the United States.

Nine of the programs offered instruction to primary, junior, and intermediate level students. Four offered courses at the junior and intermediate levels, while the remaining 3 participants indicated courses were offered at: (a) both the primary and

junior levels, (b) intermediate level, or (c) junior level. Three offered remedial assistance, one enrichment or gifted programming, and one offered both. Primary is defined as kindergarten to grade 3, Junior as grades 4 to 6, and Intermediate as grades 7 and 8.

Participants indicated that the online component of the delivery methodology varied between 5% and 100%. Replies to this question indicated some confusion amongst participants about what information was being sought. Consequently, no attempt has been made to interpret the data provided for this statement in the study.

Response Patterns by Frequency and Percentage

Participant response frequencies and percentages for the total number of statements and the statements classified by guideline categories are to be found in Table 1. Frequency and percentage results for each of the 101 statements are found in Appendix M.

All Statements

Responses to the survey questionnaire were very complete. The 16 participants were required to respond to 101 statements, making for a total of 1,616 possible responses. As shown in Table 1, of the possible 1,616 entries there were only 15 incidents (0.9%) of missing data. Of these 15, 7 incidents occurred in the responses of one participant. Overall, respondents selected the Agree or Strongly Agree values for the majority of the statements. Of the possible 1,616 entries, 47.6% (770) selected the Strongly Agree value, 38.0% (614) the Agree value, 10.5% (170)

Table 1

Frequency and Percentage Responses for All Statements and Statements Combined by Guideline Categories

	Total	StD	D	N/U	A	StA	NR
All statements							
Frequency	1,616	14	33	170	614	770	15
Percent	100	0.9	2.0	10.5	38	47.6	0.9
Program statements							
Frequency	464	6	15	50	159	231	3
Percent	100	1.3	3.2	10.8	34.3	49.8	0.6
Instructor statements							
Frequency	256	2	6	22	97	126	3
Percent	100	0.8	2.3	8.6	37.9	49.2	1.2
Student statements							
Frequency	336	0	3	36	146	151	0
Percent	100	0	0.9	10.7	43.5	44.9	0
Organization statements							
Frequency	416	4	8	51	170	176	7
Percent	100	1	1.9	12.3	40.9	42.3	1.7
Technical statements							
Frequency	144	2	1	11	42	86	2
Percent	100	1.4	0.7	7.6	29.2	59.7	1.4

Note. StD = Strongly Disagree, D = Disagree, N/U = Neutral or Undecided, A = Agree, StA = Strongly Agree, NR = No Response

the Neutral/Undecided value, 2.0% (33) Disagree, and 0.9% (14) selected Strongly Disagree.

When the Agree and Strongly Agree values are grouped together, as shown in Table 2, they represent 85.6% (1,384) of the possible responses. When the same is done with the Strongly Disagree and Disagree values they represent 2.9% (47) of the possible responses.

Statements Grouped or Classified by Guideline Categories

Examination of the frequency and percentage responses as they relate to the five guideline categories revealed some differences. As seen in Table 1, the Student category was the only one in which none of the respondents strongly disagreed with any of the statements. This category was also the only one in which there were no incidents of missing data.

Similarly, the combined response frequencies and percentages (Table 2) related to the five guideline categories (Program, Instructor, Student, Organization, and Technical) also revealed some differences. In examining the relative ranking of the Agree/Strongly Agree combined value for the five guideline categories, we find they range from a high of 88.9% to a low of 83.2%. Technical guidelines (88.9%) received the highest Agree/Strongly Agree combined value, and Student guidelines (88.4%) the second highest. These were followed by Instructor (87.1%) and Program (84.1%). Organization (83.2%) had the lowest combined frequency.

In examining the relative ranking of the Disagree/Strongly Disagree combined frequency for the five guideline categories, we find that they range from a high of 4.5% to a low of 0.9%. Program guidelines (4.5%) received the highest

Table 2

Frequency and Percentage Responses for All Statements and Statements Combined by Guideline Categories, Using Strongly Disagree/Disagree and Agree/Strongly Agree Values Combined

	Total	StD/D	N/U	A/StA	NR
All statements					
Frequency	1616	47	170	1384	15
Percent	100	2.9	10.5	85.6	0.9
Program statements					
Frequency	464	21	50	390	3
Percent	100	4.5	10.8	84.1	0.6
Instructor statements					
Frequency	256	8	22	223	3
Percent	100	3.1	8.6	87.1	1.2
Student statements					
Frequency	336	3	36	297	0
Percent	100	0.9	10.7	88.4	0
Organization statements					
Frequency	416	12	51	346	7
Percent	100	2.9	12.3	83.2	1.7
Technical statements					
Frequency	144	3	11	128	2
Percent	100	2.1	7.6	88.9	1.4

Note. StD/D = Strongly Disagree/ Disagree, N/U = Neutral or Undecided, A/StA = Agree/Strongly Agree, NR = No Response

Disagree/Strongly Disagree combined frequency and Instructor guidelines (3.1%) the second highest. These were followed by Organization (2.9%) and Technical (2.1%). Student guidelines (0.9%) had the lowest combined frequency for Disagree/Strongly Agree.

The Neutral/Undecided value also exhibited a range between the five categories. The Organization category had the highest proportion (12.3%) of responses that indicated participants were neutral or undecided about statements. Organization was followed by Program (10.8%), Student (10.7%), and the Instructor category (8.6%). The Technical category had the lowest proportion at 7.6%.

Response Patterns by Mean Agreement Level

Complete descriptive statistics for the 101 statements are found in Appendix N. Statements ranked in order of descending mean can be found in Appendix O. Response patterns will be examined in terms of the mean agreement and the variance in agreement.

Response Patterns by Mean

In order to determine the statements that received the most agreement by participants and those with which participants least agreed, mean agreement levels were calculated. By assigning the numeral 1 to Strongly Disagree, 2 to Disagree, 3 to Neutral or Undecided, 4 to Agree, and 5 to Strongly Agree, it is possible to calculate the mean agreement level for each statement item.

As can be seen in Table 3, 81 (80%) of the mean responses fell within a range of 4 to 4.99, indicating agreement with the statements. One of the statements

Table 3

Mean Agreement by Frequency and Percentage

Mean range	1 - 1.99	2 - 2.99	3 - 3.99	4 - 4.99	5
Frequency	0	1	18	81	1
Percent (rounded)	0	1	18	80	1

(1%) had a mean response of 5, indicating strong agreement by all participants. This statement was: "S20 Students should have the support of their families." Eighteen (18%) were within a range of 3 to 3.99, indicating an undecided or neutral response to those statements. The mean agreement to only one (1%) statement fell within a range of 2 to 2.99, indicating disagreement with the statement. This statement was: "P6 The factors which determine learning in a distance education setting are no different than those for traditional settings." Zero (0%) statements fell within the 1 to 1.99 range, indicating that there was no overall strong disagreement to any of the statements. In total, 19 of the 101 statements received a mean response lower than 4. These statements and the mean agreement response for each are listed in Table 4.

As can be seen in Table 5 of the 82 statements with a mean agreement response of 4 or higher, 23 were from Program, 20 from Organization, 18 from Student, 12 from Instructor, and 9 from Technical. The percentage of the total items in each category with a mean agreement of 4 or higher can also be seen in Table 5. The Technical category had the highest proportion with 100%. This was followed by Student with 86%, Program with 79%, and Organization with 77%. The Instructor category had the lowest proportion with 75%. The 82 statements with a mean agreement level of 4 or higher can be reviewed in Appendix O.

Examination of Table 6 reveals that of the 19 statements with a mean agreement response below 4, 6 were from the Program and 6 were from the Organization guideline categories, 4 from Instructor, 3 from Student, and none from Technical. The percentage of the total items in each category with a mean agreement below 4 can be seen in Table 6. We see that the Instructor category had the highest

Table 4

Statements With Mean Agreement of 3.99 or Lower

	n	Min.	Max.	Mean	SD
P6 The factors which determine learning in a distance education setting are no different than those for traditional settings.	15	1	5	2.67	1.29
P20 The program should provide images of the students if possible.	16	1	5	3.25	1.06
i12 Approval to teach online courses should not be given to instructors until they have demonstrated that they can adapt their teaching to an online setting.	15	1	5	3.47	1.13
P15 The program should provide occasional face-to-face meetings between students where possible.	16	2	5	3.56	0.89
P14 The program should provide occasional face-to-face meetings between students and instructors where possible.	16	2	5	3.69	1.14
P19 The program should provide images of the instructor if possible.	16	1	5	3.69	0.95
S7 Students should be made to feel like they are working closely with their peers.	16	2	5	3.75	0.93
O13 Scheduling may be a problem where students in different locations (time zones) are being delivered instruction at the same time.	16	1	5	3.75	1.00
O6 Policies concerning use of the technology by employees must be established.	16	2	5	3.81	0.98
i5 Distance teaching places increased demands on instructor's time.	16	2	5	3.81	1.05
O2 A high degree of management control is required.	16	2	5	3.81	1.05
i6 Instructors require additional planning time.	16	1	5	3.81	1.11
O25 Students are increasingly seeking out and requesting distance learning experiences.	15	3	5	3.87	0.64
S8 Students should be able to interact freely with their peers.	16	3	5	3.88	0.62
P24 The program should provide both synchronous and asynchronous methods of communication.	16	1	5	3.88	1.09
O21 Administrative commitment to instructors can be demonstrated in part by salary.	15	1	5	3.93	1.10

(table continues)

	n	Min.	Max.	Mean	SD
S10 Students should be provided with opportunities for real time (synchronous) communication with their peers.	16	3	5	3.94	0.68
i4 The instructor's role is changed from primarily being deliverer of instruction to an individual who creates learning experiences or guides.	16	2	5	3.94	1.00
O14 Evaluations or assessments should be conducted with new learners to gain an understanding of student knowledge and skill levels prior to them commencing participation in the program.	16	1	5	3.94	1.06

Note. n = number of responses, Min. = lowest individual score given, Max. = highest individual score given, Mean = mean of all responses, SD = standard deviation

Table 5

Frequencies and Percentages of Statements With Mean Agreement of 4 or Higher

	Program	Instructor	Student	Organization	Technical
Number of responses	29	16	21	26	9
Mean 4 or higher	23	12	18	20	9
Percentage	79%	75%	86%	77%	100%

Table 6

Frequencies and Percentages of Statements With Mean Agreement of 3.99 or Lower

	Program	Instructor	Student	Organization	Technical
Number of responses	29	16	21	26	9
Mean 3.99 or lower	6	4	3	6	0
Percentage	20.69%	25%	14.29%	23.08%	0%

proportion with 25%. This was followed by Organization with 23.08%, Program with 20.69%, and the Student category with 14.29%.

Since each level of agreement has a value attached (i.e., Strongly Disagree = 1, Agree = 2, Neutral/Undecided = 3, Agree = 4, and Strongly Agree = 5), a mean agreement value can also be calculated for all of the statements grouped together and for the statements grouped by guideline category. Agreement for all statements and for each category of statements is shown in Table 7. Mean agreement ranged from 4.45 to 4.22. The Technical category had the highest mean agreement (4.45). It was followed by Student (4.34), Instructor (4.31), and Program (4.29) categories. The Organization category had the lowest mean agreement (4.22).

Response Patterns by Variance

In order to determine the statements that elicited the most variable responses from participants, the standard deviation from the mean for each statement and category of statements was examined. Most statements had a standard deviation of less than 1.

Only 15 of the 101 statements had a standard deviation of 1 or greater. These are listed in Table 8. They ranged from a high of 1.29 to a low of 1.00. The statement with the highest standard deviation (1.29) was: "P6 The factors which determine learning in a distance education setting are no different than those for traditional settings."

As shown in Table 9, of the 15 statements that had a standard deviation of 1 or higher five were from the Organization guideline category, four from Program, three

Table 7

Mean Agreement and Standard Deviation For All Statements and All Statements Combined by Guideline Categories

	Mean	SD
All Statements	4.32	
Program Statements	4.29	0.27
Instructor Statements	4.31	0.21
Student Statements	4.34	0.29
Organization Statements	4.22	0.26
Technical Statements	4.45	0.43

Table 8 **Statements With a Standard Deviation of 1 or Greater**

	n	Min.	Max.	Mean	SD
P6 The factors which determine learning in a distance education setting are no different than those for traditional settings.	15	1	5	2.67	1.29
P14 The program should provide occasional face-to-face meetings between students and instructors where possible.	16	2	5	3.69	1.14
i12 Approval to teach online courses should not be given to instructors until they have demonstrated that they can adapt their teaching to an online setting.	15	1	5	3.47	1.13
i6 Instructors require additional planning time.	16	1	5	3.81	1.11
O21 Administrative commitment to instructors can be demonstrated in part by salary.	15	1	5	3.93	1.10
P24 The program should provide both synchronous and asynchronous methods of communication.	16	1	5	3.88	1.09
P20 The program should provide images of the students if possible.	16	1	5	3.25	1.06
T6 Open technical/software standards (html, PDF, etc.) should be used.	16	1	5	4.06	1.06
T7 Technologies which allow the use of a number of different, individual media should be used.	16	1	5	4.06	1.06
O14 Evaluations or assessments should be conducted with new learners to gain an understanding of student knowledge and skill levels prior to them commencing participation in the program.	16	1	5	3.94	1.06
i5 Distance teaching places increased demands on instructor's time.	16	2	5	3.81	1.05
O2 A high degree of management control is required.	16	2	5	3.81	1.05
O19 Market share can be expanded beyond traditional areas through Web based instruction.	16	1	5	4.00	1.03
O13 Scheduling may be a problem where students in different locations (time zones) are being delivered instruction at the same time.	16	1	5	3.75	1.00
i4 The instructors role is changed from primarily being deliverer of instruction to an individual who creates learning experiences or guides.	16	2	5	3.94	1.00

Note. Min. - lowest individual score given, Max. - highest individual score given

Table 9

Frequencies and Percentages of Statements With a Standard Deviation of 1 or Higher

	Program	Instructor	Student	Organization	Technical
Number of responses	29	16	21	26	9
SD 1 or higher	4	3	0	5	2
Percentage	13.79%	18.75%	0.0%	19.23%	22.22%

Note. Percentage – percent Standard Deviation 1 or higher of N

from Instructor, two from Technical, and none from Student. In examining the proportions these numbers represented of the total number of statements in each category, we see that Technical had the highest proportion with 22.22%. This was followed by Organization with 19.23%, Instructor with 18.75%, and Program with 13.79%. The Student category had zero percentage represented.

The standard deviation from the mean was also calculated for the statements grouped by guideline category (Table 7). These ranged from a high of 0.43 for the Technical category to a low of 0.21 for the Instructor category. The intermediary standard deviation values were 0.29 for Student, 0.27 for Program, and 0.26 for Organization. This suggests that when grouped by guideline category the participants were in considerable agreement with one another, except perhaps in the Technical area, and even here the differences were not great.

Response Patterns by Independent Variables

To investigate whether participants' agreement with the survey statements was associated with Gender, Years of Experience, or Employee Group, independent t tests were conducted. This was done with the statements individually and with the statements grouped by guideline category.

Although the overall sample size was relatively small, significant relationships were found for some items when independent t tests were undertaken with all 101 individual statements. It must be noted that because of the large number of tests conducted, it is likely that some of the significant relationships occurred by chance. Therefore, a probability level of .01 was used as the criteria for significance.

Independent t tests conducted to see if responses were associated with Gender revealed two statements where the p level was < .01. These are listed in Table 10. One of these was from the Student category and one was from the Instructor category. The statement with the greatest probability of significance (.002) was: "i5 Distance teaching places increased demands on instructor's time."

Tests conducted to see if responses were associated with Years of Experience revealed two statements where the p level was < .01. They are itemized in Table 11. Again, one of these was from the Student category, and one was from the Instructor category. The statement with the greatest probability of significance (.001) was: "S17 Some students may find it difficult to function in an online environment."

Independent t tests conducted to examine whether responses were associated with Employee Group revealed no statements where the probability level was less than .01. Likewise, no differences were found with the statements grouped by guideline category.

Response Patterns of the Qualitative Data

Although qualitative data are not typically quantified in studies using qualitative methods, it is thought that in this study it is necessary to give readers a sense about the amount and type of qualitative data that was collected in what was primarily a quantitative study.

Twelve of the 16 participants provided qualitative data of varying types and detail. They varied from simple notations, such as a question mark, to detailed statements. They were either directly related to one or more of the 101 statements or expressed additional criteria the participants considered important to elementary

Table 10:

Statements Where Responses Differed by Gender

Statement	t	p	n	Mean	SD
i5 Distance teaching places increased demands on instructor's time.	3.740	.002			
Male			9	4.38	.74
Female			7	3.0	.82
S17 Some students may find it difficult to function in an online environment.	2.955	.008			
Male			9	4.5	.53
Female			7	3.86	.38

Table 11:

Statements Where Responses Differed by Years of Experience

Statement	t	p	n	Mean	SD
i10 Instructors must be dedicated to the concept of distance education.	-2.767	.01			
Inexperienced (1-3 Years)			9	4.44	.53
Experienced (4+ years)			7	5	.00
S17 Some students may find it difficult to function in an online environment.	-4.026	.001			
Inexperienced (1-3 Years)			9	3.89	.33
Experienced (4+ years)			7	4.71	.49

C-MODE.

A total of 57 comments and notations were made concerning 43 of the 101 statements. Of these, 21 related to statements in the Organization category, 11 in the Student category, 10 in Program, 8 in Instructor, and 7 in Technical.

Only three statements had three comments made about them, eight had two comments, and 32 one. The three statements that received three each were: (a) i5 Distance teaching places increased demands on instructor's time, (b) O12 Support personnel provide a vital link between students and instructors, and (c) O21 Administrative commitment to instructors can be demonstrated in part by salary.

Twenty-four comments were made that did not relate specifically to any of the 101 statements. Of these 24, 12 were related to program or course or both, 6 to instructors, 3 each to students and technical aspects, and zero to organizational aspects.

A number of themes emerged from the qualitative data. Because these form an integral part of the analysis they are presented, as well as discussed, in the analysis section of this chapter.

Analysis of Findings

This section presents general findings as they relate to the research purpose, followed by findings related to individual statements identified, and then those related to the grouped statements in the five guideline categories. Finally, the qualitative data are examined as they relate to all of these and any new themes that emerge.

General Findings

The major finding of the study is that the participants agreed or strongly agreed with the large majority (81%) of the statements. Of the total possible 1,616 responses, 85.6% were either to agree or strongly agree. Similarly, 82 of the 101 statements had a mean response of 4 or higher. These findings suggest that these 82 statements or guidelines could be adopted as criteria for the effective implementation and practice of C-MODE at the elementary level. The remaining 19, having a mean response of 3.99 or lower, should be the subject of further review before being adopted or discarded.

Findings Related to Individual Statements

In this section those statements with the highest agreement and the lowest variance are discussed, followed by those with the lowest agreement and the highest variance. Finally, there is an examination of statements where participants' responses were associated with Gender, Years of Experience, and Employee Group.

Statements receiving highest agreement and lowest variance in response.

Of the 82 statements receiving overall agreement there was one, "S20 Students should have the support of their families," that received unanimous support from all 16 (Mean = 5, SD = 0.00) participants, indicating that they all strongly agreed with this statement. Statements receiving unanimous strong agreement are referred to in this study as Tier 1 statements. All statements ranked within their respective Tiers can be reviewed in Table 12. It would seem that to this group of individuals the role of the students' parents in elementary C-MODE is seen as very important.

Review of the literature revealed only one study in which the role of family members was mentioned as a contributing factor, resulting in the statement's inclusion in the questionnaire. This low representation in the literature is understandable since the majority of online distance education literature focuses on practices at the postsecondary level. In elementary education, where students are normally unable to work as independently as adult learners, it is reasonable to expect that the role of the parents or supporting adults is an important one. Clearly, parents will have a significant impact on students' abilities to function and be successful in an online learning environment.

Of the remaining 81 statements receiving overall agreement, those having a higher mean agreement tended to have a lower standard deviation, and conversely those with a lower mean agreement tended to have higher standard deviations. Of these, there were 34 statements which not only had a mean agreement of 4 or higher, but had no single response lower than 4. Thus, all participants either agreed or strongly agreed with the statement. All 34 also had a standard deviation of 0.52 or lower. These should be looked upon as a second tier (Table 12) of statements that received universal support and amongst the first to be adopted into practice. The remaining 47 statements represent a third tier (Table 12) of support. These had mean agreement of 4 or greater, but had incidences of responses lower than 4, so they cannot be viewed as having universal support. However, they can be considered as valid criteria or guidelines because of the generally strong support they received.

Table 12

82 Statements Receiving Overall Agreement

Tier 1
S20 Students should have the support of their families.
Tier 2
P3 Administrators, instructors, and support staff need to work in concert to produce quality distance education programming.
P27 Course curriculum development is crucial.
i1 Instructors must be familiar with the curriculum.
P1 Clear goals for the program must be established.
P2 The curriculum and educators, and not the technology, must drive the program.
S4 Students will need to develop the ability to be more self-disciplined.
S12 Students should be able to communicate readily and directly with the instructor.
S18 Students benefit from being informed about the instructor's expectations and rules and procedures for the distance education class.
T4 Technical support for instructors should be provided.
P4 The program must be continually evaluated by administrators and instructors.
P8 Clear, relevant content should be provided.
P16 Feedback to students must be ongoing rather than exclusively at grading periods.
P26 Course design is crucial.
O3 Excellent communication channels must be established.
i2 Instructors must be familiar with the program delivery technology.
P21 Program orientation must be provided to students.
P22 Program orientation must be provided to parents.
P29 Detailed course outlines should be provided for students.
i3 Instructors must be familiar with the technology, as it will be experienced by the student.
i10 Instructors must be dedicated to the concept of distance education.
O10 Organizations need to be sensitive to the fact that the technical, operational problems that sometimes accompany online use, can lead to frustration for employees.
T8 Technical instructions should be provided (print based or online).
O11 Properly designed and maintained administrative and support systems must be established.

(table continues)

O22 Administrative commitment to instructors can be demonstrated in part by workload allocations.
i11 Instructors should be trained in distance education practices.
S1 Students may not have the immediate technical skills to deal with online work.
S15 Students need to participate in regular and frequent activities above and beyond watching or reading information on a computer screen.
S21 Students should be committed to learning at a distance.
O24 Administrative commitment to instructors can be demonstrated in part by involving instructors in the planning and decision making process.
O26 Resources and time must be provided for ongoing staff development.
i7 Instructors may be required to develop a new set of related skills.
i8 Instructors should be certified to teach at the grade level to which they are assigned.
S3 Students should be allowed some flexibility in the speed at which they proceed with course material.
i13 Teaching at a distance would allow teachers to be hired from jurisdictions in which they may not reside.

Tier 3

T2 Having a well trained, technological staff is essential.
T3 Technical support for students should be provided.
i14 Instructors require sensitivity and compassion in dealing with student fears, apprehensions and coping mechanisms related to C-MODE
O9 Policies concerning ethical issues must be established.
T1 The program delivery technology must be kept in continual operation.
O17 Ongoing upgrades to computer infrastructures will be required.
P11 A variety of teaching methods should be used.
P23 Program orientation must be provided to school employees.
T9 Software orientation must be provided.
i15 Instructors need to assist students to make sense of and adapt to the distance learning technology.
O20 Administrative support must be provided to instructors if they are to become effective distance educators.
P17 Postings of assignments should be available in an online archive for ongoing review by students and staff.
P9 Cues and deadlines must be established to help students keep on-track.
S16 Students benefit from the ability to interact with students from a wide range of different backgrounds.
S19 The technical, operational problems that sometimes accompany online use can interfere with the educational experience and lead to frustration for students.

(table continues)

O1 A high degree of planning is required.
P12 An attempt to accommodate all learning styles should be made.
P25 The program should provide at least an equivalent learning experience to being in a class setting.
i16 Instructors may find it necessary to make adjustments to student workload during the course.
S6 Students should be made to feel like they are part of a learning group.
S11 Students should be provided with opportunities for real time (synchronous) communication with instructors.
S17 Some students may find it difficult to function in an online environment.
O18 Distance education enterprises need to demonstrate a high degree of fiscal accountability.
P13 The program should attempt to provide individualized instruction.
i9 Instructors should be qualified to teach specific content.
O8 Policies concerning copyright must be established.
T5 Students should be able to participate using any computer platform (Windows, Macintosh, etc.)
O16 Operational costs must be monitored closely to determine true costs.
S5 Students may feel isolated from time to time.
O12 Support personnel provide a vital link between students and instructors.
P28 A team approach should be used to develop course materials.
O15 There are often hidden costs for institutions.
O7 Policies concerning use of the technology by students must be established.
O4 Policies concerning intellectual property rights must be established.
P7 A variety of presentation formats using a variety of online media should be used to deliver the program.
P5 Participating students must be allowed input in the program evaluation process.
P10 Both individual and group learning experiences should be provided.
S14 Students should be provided with opportunities to participate in the ongoing evaluation of the program in which they are enrolled.
O23 Administrative commitment to instructors can be demonstrated in part by assurances of job security.
T6 Open technical/software standards (html, PDF, etc.) should be used.
T7 Technologies which allow the use of a number of different, individual media should be used.
S9 Students should have opportunities for informal interaction with their peers.
S2 Students require opportunities for both individual learning and group learning activities.
O5 Policies concerning royalties must be established.

(table continues)

P18 Postings of student work should be available in an online archive for ongoing review by students and staff.
S13 Students should be provided with opportunities to participate in the ongoing evaluation of their own progress.
O19 Market share can be expanded beyond traditional areas through Web based instruction.

Note. Tier 1: mean agreement 5, all responses strongly agreed. Tier 2: mean agreement 4 or higher, all responses either agreed or strongly agreed. Tier 3: mean agreement 4 or greater, some incidences of responses lower than agreed or strongly agreed

Statements receiving lowest agreement and highest variance in response.

It should be noted that the three statements with the lowest mean agreement had means lower than 3.5, so that they must be viewed as either within the Disagree range, as one is, or approaching disagreement. The remaining 16 had a mean higher than 3.5 and as such should be viewed as approaching the Agree range.

Data analysis revealed several individual statements where participants' opinions differed or they had strong feelings about the statement. The statement which produced the strongest expression of sentiments was "P6 The factors which determine learning in a distance education setting are no different than those for traditional settings," which had the lowest overall mean agreement (2.67) of the 101 statements. This statement also produced the greatest response variance (SD 1.29). Opinions were very mixed concerning this issue, but the general trend was disagreement. This was one of the few statements for which all five levels of agreement/disagreement were endorsed. The variance may have been caused by true differences of opinion or it may be a function of differences in the way the statement was interpreted. Some participants may have seen it as referring to the factors or processes that are in play as the student sits alone working on a learning activity. Others may have interpreted it as referring to the factors that affect the whole experience of participating in C-MODE, which might include the availability of the instructor, the adequacy of technology, the supportiveness of the parents, or other factors they perceive as being specific to the delivery methodology.

Regardless of the cause of this low agreement and wide variance of opinion, it suggests that we cannot assume that the factors that impact online elementary

education and traditional elementary education are the same. This area is one that should receive attention in future elementary C-MODE research initiatives.

The statement that received the second lowest mean agreement (3.25) was "P20 The program should provide images of the students if possible." It also had the seventh highest variance (SD 1.06). The low agreement with this statement would likely not be surprising to anyone who is involved with the integration of Internet technology into any elementary educational setting. This issue is one that has been the subject of widespread debate amongst educators. The generally accepted practice is to avoid placing photos of students on educational web-sites to enhance child protection.

Examination of the frequency responses (Appendix M) to the "P20" statement revealed that 7 of the participants indicated that they were Neutral/Undecided. Clearly, many are still formulating their opinions concerning this issue. Of the remaining 9 participants, 6 agreed or strongly agreed and 3 disagreed or strongly disagreed. The low mean appears to be a reflection of the uncertainty or neutrality around this issue rather than wholesale disagreement. It can be speculated that the highest proportion of decided individuals (the 6 who responded Agree or Strongly Agree) do not perceive this as a major security problem. They may perceive a need to provide students, who usually would not have opportunities to meet face-to-face, with a means of getting to know one another. In an online educational setting there is greater likelihood that this is done in password protected areas of the site than would be the case for web-sites at conventional institutions. It is hoped that this would ensure that individuals not affiliated with the school are prevented from viewing

images of students. The uncertainty of opinions associated with this issue should promote future study.

The third lowest ranked statement by mean (3.47) was "i12 Approval to teach online courses should not be given to instructors until they have demonstrated that they can adapt their teaching style to an online setting." It also had the third highest variance (SD 1.13). Examination of the frequencies (Appendix M) related to this statement revealed that 6 individuals were neutral/undecided, 7 agreed or strongly agreed, 1 disagreed, 1 strongly disagreed, and 1 did not respond to this statement. Again, the general response is uncertainty or neutrality concerning the issue, resulting in a low mean agreement value. Seven of the decided participants responded Agree or Strongly Agree, while only 2 responded Disagree or Strongly Disagree. This would indicate that the trend amongst those who have formulated opinions about this question view the adaptation of teaching style to suit the online environment as important.

The second highest ranked statement in terms of variance (SD 1.14) from the mean was "P14 The program should provide occasional face-to-face meetings between students and instructors where possible." As shown in Appendix M, the 16 participants responses were almost evenly split amongst Disagree (3), Neutral/Undecided (4), Agree (4), and Strongly Agree (5). A variance of opinion related to this statement is not unexpected. Students participating in C-MODE may live great distances from their instructors, making it logistically difficult to meet. The requirement to meet face-to-face would also place additional workload on instructors, who would in all likelihood be the ones, rather than the students, required to travel to

the meeting. Alternatively, the variance in response may be a function of how the meaning of face-to-face meetings was interpreted. Some may consider synchronous video conferencing as face-to-face, while others may consider it necessary to be together physically to fulfill the definition.

In reviewing the remaining 16 statements with a mean of 3.99 or lower and the 12 statements with a standard deviation greater than one, it is obvious that there are some common elements or themes that many of the statements share. Consequently, they will be discussed collectively. These themes are also present in some of the statements already discussed. One is related to the role and workload of online instructors. Statements i12, i5, i6, i4, and i14 relate directly to this theme, and statements P19 and O21 indirectly. The five directly relating statements also had a standard deviation of 1 or higher. In examining the Neutral/Undecided frequencies of these five statements, we see that i12 had 6, i5 4, i6 5, i4 2, and P14 4. One participant did not respond to statement I12. It appears that many individuals are uncertain concerning these statements. The lower means in most cases must be seen as a function of this uncertainty or neutrality. This uncertainty, and higher variance within some statements, may indicate that the issues related to instructor role and workload are still evolving and/or not practiced consistently among online institutions. An investigation that would seek to identify some guidelines for the instructor role and workload would seem to be indicated.

A second theme that is conspicuous in the statements with lower mean agreement is one related to the logistics imposed by online communication. Statements P15, P14, P24, S10, and O13 relate directly to this theme, and statements

S7 and S8 indirectly. Statements P14, P24, and O13 also had a standard deviation of greater than 1. Again, for these statements the lower means seem to be a function of participants being undecided about their opinions. Statement P15 had 5 Neutral/Undecided responses, P14, P24, O13, S10, and S8 all had 4, and S7 had 6. This sense of neutrality or uncertainty regarding logistics may be more pronounced than the statements related to the instructor theme because they tended to have fewer Disagree and Strongly Disagree responses. Most had none or one, with only P15 having 2 Disagree responses and P14 3. This trend to uncertainty or having neutrality may be an indication that practitioners and institutions are still sorting out what constitutes best practice. It would also seem reasonable to assume that best practice may vary from one program to another based upon what geographic area or what types of students they serve. Again, this appears to be an area in need of future investigation.

Most of the statements that did not fall into one of these two themes were related to Organization statements. Two others fell into the Technical category. All of these reflected differences of opinions or uncertainty/neutrality about opinions, and no one overriding theme could be attributed to them.

Association between gender and survey responses. In examining Table 9 we see that the p value ($p = .002$) related to the statement "i5 Distance teaching places increased demands on instructor's time" was very low. Males' mean response of 4.38 indicated they were in much greater agreement with this statement than females, who had a mean response of 3.0. Men's opinions also reflected less variance (.74) than the women (.82). Examination of gender frequencies revealed that only one male was

neutral/undecided and the remainder agreed or strongly agreed. The women were evenly split. Two disagreed, 3 were neutral/undecided, and 2 agreed or strongly agreed. The difference may be a reflection of the generally accepted belief that men are more comfortable with computer technology than women, but understanding this difference will require additional investigation.

Men and women also responded differently (p =.008) to the statement "S17 Some students may find it hard to function in an online environment." Males had an overall mean agreement of 4.5 to this issue, indicating strong agreement. Females gave it a lower mean agreement response of 3.86. Females demonstrated less variance (.38) than the males (.53). Years of Experience was also significantly associated (.001) with this statement. Analysis of the role of gender as it relates to differences expressed concerning this statement will be discussed along with the analysis of the years of experience differences.

Association Between Years of Experience and Survey Responses. As previously stated, agreement with the statement "S17 Some students may find it difficult to function in an online environment" was identified as being significantly associated with both Gender and Years of Experience t tests. It also had the highest p value of significance (p = .001) within not only Years of Experience but within all t tests conducted. Examination of the relationship between participants' gender and their years of experience revealed that there were 5 inexperienced and 2 experienced female participants. There were 3 inexperienced and 6 experienced males. Thus, female participants were predominately inexperienced and male participants predominately experienced practitioners. Overall, the experienced practitioners were

in much higher agreement with the statement than the inexperienced, with a mean of 4.71 as opposed to 3.89. Conversely, the inexperienced practitioners demonstrated slightly less variance (.33) in their opinions than did their experienced colleagues (.49). It appears that it is Years of Experience rather than Gender that primarily creates this significant difference of opinion. It would appear that, with more experience, participants may have come to a greater understanding of the varying capabilities of students in an online setting. Or they may have had more exposure to situations where students experienced difficulty. Consequently, experienced, predominately male participants agree more strongly with this statement than the less experienced, predominately female members of the study.

Years of Experience was also significantly ($p = .01$) associated with the statement, "I10 Instructors must be dedicated to the concept of distance education." Examination of the means and standard deviations did not reveal any discernable differences in opinions or variance. Experienced participants, with a mean of 5, all strongly agreed with the statement. Although inexperienced respondents had a lower mean response (4.44), they too were in agreement with the statement. The experienced group did not vary at all (0.00) in their responses, and the inexperienced group varied only slightly (.54). Examination of the frequencies revealed that all experienced participants responded Strongly Agree, while only 4 of the inexperienced participants responded Strongly Agree. Both groups were in agreement with the statement, but with the experienced group slightly more strongly in agreement and completely consistent in that opinion. Obviously, these individuals see the dedication of instructors to C-MODE as being very important.

Although we can use the trends presented in the results of the independent t tests as guiding possible future research, the significant differences suggested here would need to be corroborated or refuted in another study involving a much larger number of participants. And that study should involve relatively equal representations of gender, years of experience, and employee group.

Findings Related to Guideline Groups

Of the five guideline categories, Technical and Student appear to be the most strongly supported, with the Instructor category assuming the intermediary position. Program and Organization appear to have the least support.

The Technical category had the highest mean agreement (4.45), the highest proportion (88.9%) of Agree/Strongly Agree responses, and the second lowest proportion (2.1%) of Strongly Disagree/Disagree responses. This category had the lowest proportion (7.6%) of Neutral/Undecided responses. All of the statements in this category had a mean value of 4 or higher. Most participants seemed to have clear opinions related to the Technical statements and for the most part responded in the affirmative. It is interesting however, that this group of statements exhibited the highest variance (0.43), and by an appreciable margin over the range (SD = 0.21 – 0.29) exhibited by the other four groups. If this high level of support is an accurate reflection of the participant's sentiments relative to the other groups, the pattern may well be attributable to the fact that technical issues may be less subjective in nature and have the least direct impact on participants. Or these statements may be seen as easier to form opinions about and to positively support. On the other hand, we must consider that this high level of support may simply be a function of the small number

(nine) of statements in this category. If even one of the statements had received low mean agreement, it is likely that the overall mean agreement would have been lower for this category. Given the limitations created by the small number of statements, we should not consider this to be the category with the highest level of support.

The Student category of statements received the second highest level of support. It had the second highest mean agreement (4.34), lowest proportion (0.9%) of Strongly Disagree/Disagree responses, including no Strongly Disagree responses, and the second highest level (88.4%) of Agree/Strongly Agree support. This category also had the second lowest proportion (14.29%) of statements with a mean of 3.99 or lower. It had relatively low variance in that no statements had a standard deviation of 1 or higher. This category should be therefore viewed as having the greatest overall support.

The Instructor group had the highest proportion (25%) of statements with a mean of 3.99 or lower and the second highest percentage (3.1%) of Strongly Disagree/Disagree responses. It also had the third highest proportion (81.1%) of Agree/Strongly Agree responses and the second lowest proportion (8.6%) of Neutral/Undecided responses. This group also had the lowest overall standard deviation (0.21). Many individuals appear to have been more decided in their opinions concerning this group of statements.

Organization had the lowest mean at 4.22. It also had the lowest proportion (83.2%) of Agree/Strongly Agree support and the second highest proportion (23.08%) of means lower than 3.99. However, these findings are mitigated by the fact that this category also had far and away the highest proportion (12.3%) of Neutral/Undecided

responses. It appears that while participants may not disagree with the statements, they are uncertain as to either the meaning of the statements or their opinion related to them. This probably is related to the fact that most of the participants were teachers and may not normally be involved in overall organizational matters.

Program has the least support, although it had the second lowest overall mean agreement at 4.29. It had the highest proportion (4.5%) of Strongly Disagree/Disagree responses and the second lowest proportion (84.1%) of Agree/Strongly Agree responses.

It may not be surprising that the student group would have the highest level of support (disregarding the Technical category findings). Most of the participants either spend the majority of their time focusing on the needs of students or have spent substantial time doing so in the past. It is likely the area to which most have given considerable thought. Consequently, they may be inclined to be more supportive of guidelines that relate to assisting students achieve success.

Nor is the low ranking given to Program and Course surprising. Because this field is in its infancy, it is likely that ideologies and theories related to how to best provide programs and individual courses are still evolving. This may result in widespread difference of opinions as to what constitutes best practice. This would be particularly true if these programs are developing in relative isolation.

More general ways of interpreting the analysis of the relative ranking of the guideline categories are possible. They may represent a continuum of the participants' level of understanding of the issues. Second, they may represent a ranking of how they prioritize the issues. Or the ranking may reflect the direct impact the category

has on their positions of responsibility. Although analysis of category rankings is restricted by the small sample size and the marked difference in the number of statements in each category, they do provide us with some basis for future research.

The process of analyzing both the individual statements and the categorized statements has led the researcher to conclude that it will be important to group statements more precisely in the next revision of the survey instrument. The literature review indicated that there were overlaps or cross-category placement of some statements in the five categories. For example, statements related to students can be found in the Program category and statements related to instructors can be found in the Organization category. A rationale was provided for this approach. These statements will be recategorized into their most directly relevant category in the final version of the instrument in order to have relatively equal numbers of statements in each category.

Findings Related to Qualitative Data

Analysis of the qualitative data provided support or additional details related to some of the themes that emerged in the quantitative data. It also revealed additional themes relevant to the practice of C-MODE at the elementary level.

Parent role. Several of the participants spoke to the role of parents. Participant male-7 wrote, "Parents are." beside the statement "O25 Students are increasingly seeking out and requesting distance learning experiences." This is in all likelihood an accurate reflection of how elementary students become involved in online education and that it will be important for practitioners to remember that parents have a vested interest in the process and have an extremely important role to play.

Another spoke to the importance of the support parents provide and their required level of commitment. Participant male-16 asserted that students "can't do it without parental support" under the statement "S21 Students should have the support of their families" and added "& parents" to "S21 Students should be committed to learning in a distance education setting."

The training or instruction of parents by instructors was seen as an important factor in supporting parents to assist students to be successful in this form of education. Participant female-14 stated:

> i14. Parents are usually the ones with fears and apprehensions. It is very important to make them feel at ease, take the time to 'Train' them in the beginning so the [sic] feel successful (as well as the student) and you will build a strong working relationship that is very important in this setting.

This notion of the importance of devoting time to train parents to ensure success was also expressed by male-5 in his statement: "Instructors must be sensitive to the needs of the child. This requires teaching the student & their home support how to use the computer properly and effectively."

Implicit in both of these statements is the need for a strong relationship between instructor and parents. This need for relationship can also be seen in female-14's statement: "It is essential that the parent/Teacher/student relationship be harmonious and allow for on-going (daily or weekly) open communication." This idea is also reflected in male-16's remark: "Teachers will find that they get to know @ [sic] family personally more than reg. classroom."

From all of these comments we can infer that the participants generally believe that parents play a very important and large role in the student's educational process, that parents need to be trained along with the students to ensure student success, and that a strong relationship between parents and instructors should be established. It is also reasonable to conclude that the participants view these qualities as more important in C-MODE than in conventional classroom schooling.

These findings also support and are supported by the complete agreement by the study participants for the statement, "S20 Students should have the support of their families." This is the one statement for which all participants responded Strongly Agree. The role of parents was an area that was not addressed in the survey and is one that will need to be addressed in the final version of the instrument and in future studies.

It is also obvious in reading these "parent-related" remarks that the increased involvement of parents also impacts directly on instructor role and workload. Perhaps it is not that surprising these were two of the other themes that emerged from the qualitative data.

Instructor role. Several comments were made regarding issues related to the instructor's role. In responding to the question of instructor dedication, male-13 remarked, "i10 Distance is much different and needs to be accepted with an open mind," implying that not only is this form of education different from conventional settings, a slightly different mindset or approach is required. Female-11 also endorsed a specific approach when stating: "i12 Instructors must be willing to learn and take risks in exploring online teaching."

The notion of the need to "learn" in female-11's assertion is also supported and expanded upon by male-16 who stated: "More than reg. classroom ongoing steep learning curve" when addressing the statement: "O26 Resources and time must be provided for ongoing staff development." Implicit in his assertions is that there is a great deal to understand and learn related to teaching in this format.

Others see that there are special skill sets that must be mastered by instructors. Male-9 believes that instructors "must develop skills to be able to relate to students at a distance." Male-16 also identifies specific skills that need to be developed and applied in stating: "All instructors must be 'Masters' at organizing and compiling filing systems that are fast, effective & efficient for student work, phone & email lists, online gradebook, homework & communication."

Female-14 warns that there may be potential hazards for online instructors related to the insular nature of the job. She writes: "Distance – Learning Educators can begin to fee [sic] isolated and 'stagnant'. It is important that they regularly communicate with each other, share ideas and get involved and attend workshops in their local areas."

From the perspective of these practitioners it would seem that instructing in a C-MODE setting is different from a conventional setting, requires the development of specific skills, and may potentially present some negative aspects. Also implicit in many of these comments is an increased workload for instructors. This was the second instructor-related theme to emerge from the qualitative data.

Instructor workload. Three participants raised some very specific points concerning online workload Male-13 had several comments concerning this issue. He

reported when commenting on a statement concerning workload that in the program in which he worked: "O22 – We currently need to carry up to 150 students to be 'full time'. With most correspondence being email and basically 150 students going at their own pace the workload is huge and often too much." Male-16 expressed a similar opinion concerning the enormity of the workload. He stated: "Instructors online will find normal classroom loads to be overwhelming." Male 13 also seemed to imply, when speaking about the huge workload, that in this form of education all students work on an individual basis. This is asserted more directly in the statement: "i5 – It is really each student with an individualized curriculum. It is 1 to 1 time!" Male-13 went on to comment on another issue that could potentially add to instructor workloads. He wrote: "T2 – Without a well trained tech staff the teacher will spend at least half of their time dealing w/tech issues of students." Male-4 also commented on the amount of time involved in the role of online instructor, as well as its individualized nature. He stated: "Distance Ed. is often like working one-on-one with a student, and by its very nature requires more time and smaller class size."

The individuals who provided feedback related to this issue appear to collectively believe that online teaching challenges instructors with a very heavy, and potentially stressful, workload. It would also seem that they believe that by its nature this form of education tends to call for individualized instruction, which is seen as contributing to the overall workload.

The sentiments expressed concerning both instructor role and workload suggest that the participants see these as important issues. As such, they warrant further investigation as they relate to the practice of C-MODE at the elementary level.

It is interesting to note that the overall findings of this study as they relate to this issue are somewhat varied. The qualitative data and the opinions of experienced practitioners seem to suggest strong, definite feelings related to instructor workload. On the other hand, some of the quantitative data seem to suggest some ongoing consideration of these issues. We can speculate that this may be a reflection of the fact that roles and workload vary for instructors from one online institution to another. This would seem to indicate a need for further investigation in these areas to identify further guidelines for effective practice in this area. As the participants of this study are primarily instructors, future study should also include students, parents, and administrators.

Communication. Another theme evident in the qualitative data was the need for effective, timely communication. Female-3 affirmed, "Communication initiated by the school is essential." This idea that the school should keep parents and students informed was reiterated indirectly in the comments of other participants. However, most of the comments related to communication underscored the need for timely communication, especially with students.

Several individuals expressed the need for the provision of prompt communication between instructors and students and/or parents. Most comments related to students being able to rapidly communicate with their instructors. Male-4 wrote: "Due to the fact that most distance ed. learners work independently, they should have ready access to the instructor." Female-14 stated that "it is essential that the parent/teacher/student relationship be harmonious and allow for on-going (daily

or weekly) open communication." Male-13 commented: "S12 Students need to feel comfortable contacting their teachers and know they will be responded to quickly."

Male-13 also felt that communication played a role in student success: "P16 – We have found immediate feedback to students & extra communication w/students greatly a students [sic] chance of completing."

Finally, Female-14 expanded on this need for rapid communication proposing that programs needed to include provisions for synchronous communication. She wrote: "'Face-to-face' is a concept I struggle with. I don't think it is essential (and nearly impossible in most cases) in the traditional sense. But real-time communication is definitely essential."

Although the communication concerns being expressed here are somewhat different than the apparent "communications logistic" theme that seemed to be present in the quantitative data, they both underscore a need for future study. The points raised here also are consistent with the desire to identify and fulfill the needs of students expressed in other areas of the findings.

Media. The final theme to emerge was a minor one expressing a need for the use of a variety of media. Male-4 commented: "The key here is to have clear goals for the program and a tested and fully developed curriculum that utilizes a variety of online media." Female-14 reported that the program in which she worked used weekly VCM [Video Conference Meeting] chats and that; "In these weekly 'chats' (VCMs) we are able to use a variety of media to enhance the experience rather than just 'chatting'." Male-16 was less specific but implied the use of various online media in stating: "Equal importance should be placed on class & course development ie tech

aspects of presenting the course online as well as course content–find ways of making courses interactive."

Female-11 expanded on the need for the use of a variety of online media to include other media as well:

> "Combining online instruction with other media (in the case of our elementary online project, with interactive video shows broadcast on [name of educational broadcaster]) increased effectiveness of the online learning experiences. Also we found a print backup to the online content was important.

Since the Internet has very quickly become a multimedia-based medium, it would not seem unexpected that educators would want to use its capabilities to the fullest to enhance learning experiences for students. The development, use, and educational merits of this aspect of the C-MODE experience should also be the focus of future research.

It must also be noted that, although not as explicit as some of the themes presented in the qualitative data, there appears to be an underlying, implicit theme related to the provision of the best possible educational experience for students. This group of distance educators seems very concerned with providing high quality education for the students they service.

The themes revealed in the qualitative data that were collected as part of this study are interesting and certainly appear to be very relevant to the issue of C-MODE at the elementary level. However, they should not be considered as definitive findings of the study for several reasons. These include the small sample size, the fact that

there was no dialogue between the researcher and the participants concerning the comments they made as would normally occur in pure qualitative research, the amount of qualitative data collected, and the fact that this was primarily a quantitative study. This should not prevent us from recognizing that these findings do have some value in terms of future research. All of the themes presented should be considered as possible areas for future investigations. As such, their value is in providing impetus for future investigations. They can also provide practitioners with a frame of reference in which to examine practices within their own organizations.

Summary of the Findings

This study identified 82 different statements or guidelines related to the successful implementation and practice of computer-mediated online education at the elementary level. It also identified a new area of potential investigation, the role of parents, which has received little attention in the online distance education literature.

The study also identified a number of areas within an elementary context where additional research is necessary. These included: (a) differences in the factors determining learning in a distance education setting and traditional settings, (b) elementary students' ability to function in an online setting, (c) the role and workload of instructors, (d) the importance of effective, timely communication with students and parents, and (e) the use of a variety of media.

Finally the study identified some significant differences by gender and years of experience in the response to a small number of statements.

CHAPTER FIVE: SUMMARY, CONCLUSIONS, AND IMPLICATIONS

Summary

This study had three purposes related to the effective implementation and practice of computer-mediated online distance education at the elementary level: (a) to identify a preliminary framework of guidelines for effective implementation and practice, (b) to identify areas of C-MODE for which criteria of effectiveness have not yet been developed, and (c) to develop an implementation and practice criteria questionnaire based on a review of the distance education literature, and to use the questionnaire in an exploratory survey of elementary C-MODE practitioners.

The currently available literature was reviewed to provide an overview of issues relevant to the implementation and practice of C-MODE at the elementary level. It began with an examination of the historical background of distance education, the Internet and World Wide Web, the use of computers in education, and the development of the Internet in distance education. The review then focused on theories of distance education, technological considerations, perceived benefits and disadvantages, the current practice of C-MODE at the elementary level, student perceptions, and identification of criteria at the postsecondary level. Finally, drawn from this literature, specific criteria for the effective implementation and practice of C-MODE were itemized and used to construct an initial survey questionnaire.

The research methodology was then described. The methodology section included an examination of the survey research method, research design, participant selection, instrumentation, data collection and recording, data analysis, methodological assumptions and limitations, and ethical considerations.

The questionnaire that was developed was first tested in a pilot study with postsecondary practitioners. The instrument was modified based upon their feedback. The modified instrument was used to survey practitioners of computer-mediated online education at the elementary level. Finally, the data were analyzed and presented.

Discussion

The most obvious conclusion to be drawn from analysis of the data collected is that the study has successfully fulfilled its first objective. Eighty-two statements have been identified which can be adopted as criteria for successful implementation and practice of computer-mediated online distance education at the elementary level. These cover a broad range of areas including program and course development, student needs, the instructor's role, organizational aspects, and technical considerations. It must be pointed out that, because of the exploratory nature of this study, these guidelines should be considered only as an initial framework that must be modified and enhanced through additional investigation. As such, they should be viewed as a point of departure in the development of a set of standards for best practice in this field.

The study can also be seen as fulfilling its second goal. It appears that there are several areas relating specifically to elementary C-MODE that have received little attention in the postsecondary literature and will need further study. These include, without being limited to, the role of the parents, the relationship between the school/instructor and the student/parents, and the needs or conditions, such as student

security, related to servicing young students. The study also revealed that although many of the issues relate to C-MODE at all levels, some may have be to examined more specifically as they relate to the elementary level. These include, without being limited to, issues such as the role of the instructor, instructor workload, communication procedures, and how to best use the multimedia aspect of the Internet to provide high-quality learning experiences.

The third goal of the study was also achieved. A practical and useful questionnaire was developed that was used to survey elementary practitioners to gain an understanding of their opinions as they related to a variety of statements or guidelines drawn from the literature. Feedback from the survey provided additional information upon which further revisions were made. These revisions included the development of a set of statements related to the role of parents and the reorganizing of some of the statements into the category to which they were most relevant. The revised questionnaire can be reviewed in Appendix P. It is hoped that this instrument, or an even further refined version, can be used with a larger sample as this field expands. It is recommended that future studies which refine the instrument prior to its use should attempt to equalize of the numbers of category statements to make comparisons between the guideline categories more practical and relevant. They should also consult literature related to home schooling to determine criteria relevant to the role of parents.

Additionally, this study has revealed a variety of areas and posed a number of questions that should be the focus of future research. These will be discussed in greater depth in the Implications for Research section of this chapter.

Although not a stated goal, the study has also revealed that much of the theoretical and research work conducted at the postsecondary level can form a basis for investigations into this form of education at the elementary level.

A more subjective conclusion derived from the study is that this appears to be a field that is evolving. The researcher is left with the impression that C-MODE is being practiced in a variety of different ways by the various institutions represented by the participants in this study. Also, it appears that established lines of communication between these institutions through which they can converse to discuss or review best practice, have not yet been developed. This would underscore the need for further research in this area and also to establish an online clearinghouse to act as a resource centre.

The findings of this study offer a variety of implications for practice, theory, and research. Although some of the findings of this study do need to be supported or replicated with larger samples, they still have an immediate role to play in terms of practice, theory, and research. They should be considered by practitioners as possible issues which may affect their programs and that require attention.

Implications for practice. A number of the findings of this study could have an immediate, direct impact on practice should practitioners choose to integrate them into their practice. Adoption of the 82 statements or guidelines would provide planners, or those seeking to establish new programs, with an opportunity to enhance their own offerings by drawing upon the experience of others in the field. Widespread adoption of the guidelines would also serve to establish an initial common frame of reference upon which a more refined framework of guidelines for implementation and

practice could be built. Institutions seeking to gradually integrate these criteria into practice may wish to initially implement the first two tiers of guidelines, which received complete support in this study, and then subsequently integrate the third tier of guidelines as they seem relevant to the specific situation.

Practitioners could also use the secondary findings from this study to guide how they deal with students. Specifically, they could ensure that adequate communication measures are in place to allow students to quickly access and receive feedback from their instructors. They should also be sensitive to the fact that some students may have difficulty functioning in an online environment and establish practices that minimize or ameliorate this barrier. Policies concerning issues that directly affect student safety, such as whether or how student photos are placed on the school web-site, should be developed and implemented.

C-MODE educators should be sensitive to the fact that parents have an important role to play. They should also ensure that, as with students, adequate communication measures are in place to allow parents to quickly access and receive feedback from their child's instructors and other members of the organization. Organizations may also find it constructive to begin to develop their own guidelines for the role of parents. This should be done through open dialogue among administrators, parents, instructors, and students. The development of guidelines would produce many benefits. First, parents could be informed prior to their child being enrolled in the program as to what their responsibilities would be in ensuring student success. Second, the program administrators and instructors would have a clear understanding of what interaction is required with parents and what the

expectations for parental involvement would be. Third, such guidelines could also provide a set of expectations or parameters by which parental involvement could be assessed to monitor parental involvement. Fourth, it would inform students regarding appropriate expectations for parents.

Online institutions should also be sensitive to the role of their instructors and related workload. Again, it would be beneficial to develop guidelines for effective practice. This should be done through dialogue between administrators, instructors, parents, students, and other institutions to develop and continually refine these in order that guidelines can be established that meet the needs of all parties. The researcher proposes that instructors take a lead role in this undertaking. The establishment of such guidelines would produce many of the same benefits as outlined for the development of parental guidelines.

Although it was not a direct finding of this study, we can also see the benefit of institutions developing guidelines for students. Pointing out what they need to do to be successful may help demystify some aspects of the process and reduce the impact of some of the potential negative aspects, such as perceptions of the difficulty of working in an online environment.

Programs may also want to consider the benefits of having experienced practitioners within the organization. New programs may want to ensure they have a blend of staff, mixing some experienced individuals with novice practitioners.

It would be beneficial for practitioners to regularly dialogue with others working in the field to facilitate the sharing of information about best practices and participate in the development of guidelines for all areas of practice. The

establishment of an Elementary C-MODE Clearinghouse could play an active role in supporting this dialogue.

Finally, the results of this study clearly indicate that practitioners should not assume that what works in a conventional classroom setting will necessarily be appropriate in an online educational setting. Most immediately, this form of education appears to be more individualized in nature than conventional educational formats.

Implications for theory. The findings of this study also have implications for the ongoing development of online distance education theory. It has confirmed that, at least in part, the theoretical work done at the postsecondary level has implications for elementary C-MODE theory. The validation of those statements from the postsecondary level literature found in this study provides further support for the work at the postsecondary level. Finally, the study can be seen as providing impetus for extending current theory. Given the findings related to such issues as the role of instructors, it appears that many areas will have to be revisited and examined in the elementary context. It has also identified a new area, that being the role of parents, that will need to be studied and integrated.

Given the strength with which participants in this study disagreed with the statement "P6 The factors which determine learning in a distance education setting are no different than those for traditional settings," it will be necessary to reconsider the theoretical underpinnings of the processes involved in learning in a conventional education setting. They will have to be reexamined to see whether they are relevant, in whole or in part, to learning in an online situation. Such an investigation could

develop theories to provide guidance for effective teaching and learning in an elementary online setting.

Although not a direct result of the findings of this study, it would seem that a review of how C-MODE is conceptualized would be appropriate. As Wellburn (1999) pointed out, there are many different way of conceptualizing online distance education. These vary from the conceptualization used for this study, where the instructor and student are remote from one another and neither is in a traditional school setting, to situations where the student is in a school setting and the teacher is delivering content from a remote location, to where both the student and instructor are in a school setting but the student is accessing information remotely. We would suggest that these various conceptualizations be reexamined with the goal of establishing clear parameters that reflect their differences and similarities.

As suggested in the literature review, the history of the use of the computer and the web in distance education should be documented. Finally, although again not a direct finding of this of this study, it appears obvious to this researcher that philosophical considerations need to be raised and examined. First amongst these would be the encouragement of an ongoing debate concerning the appropriateness of using this educational approach with children. In an era where the use of the World Wide Web continues to expand exponentially, and with it the capacity to rapidly establish web-based ventures, we risk rushing to implement elementary level C-MODE programs without thoughtful consideration not only how to best do this, but also possibly without consideration as to whether it should be done at all.

Implications for further research. The findings of this study point to several areas for future research. First and foremost, research that focuses on identifying criteria for the successful implementation and practice of computer-mediated online distance education at the elementary level should continue. As previously pointed out, because of the exploratory nature of this study, the 82 guidelines identified should be considered as an initial framework that may be modified and refined through additional investigation. The 19 statements that did not receive agreement support from the participants should also be investigated using a larger sample.

Research that identifies the similarities and/or differences in the factors that determine learning in online and conventional educational settings is required. Since it is apparent that elementary C-MODE programs will continue to be offered and parents will continue to enroll their children in them, research will help determine the best instructional practices and what students will have to do to be successful in them. The differences in the level of individualized instruction involved in both may form the basis of an initial investigation.

The whole question of the role of parents will need to be given careful consideration. Although it will need to be corroborated in future research, it appears, from the perspective of the participants in this study, that parents play a crucial role in the whole process.

This study also leads us to conclude that future research should focus on the role of the instructor. It is clear from this study that this is an issue that is still evolving. Although not directly identified, it would also seem reasonable to assume

that the roles of many of the other individuals involved in the overall process, including administrators and support staff, should be examined as well.

It would also seem appropriate to investigate the various communication methods afforded by online methods in an attempt to identify the most effective communication strategies. This should also be done with respect to the various media supported by the World Wide Web in an attempt to establish guidelines for their most effective educational use.

As suggested in the literature review, an examination of current and projected costs for C-MODE and other distance education formats should be undertaken. Finally, and perhaps most important, as this genre of education develops there will be many issues related to students and their needs that will need to be studied. This study would suggest that investigation of the psychological and social impact of participating in online education should be amongst the first areas examined. Student safety issues should also receive priority.

A Framework for Further Investigations. Although this study has suggested some specific suggestions for practice, theory, and research, there are other areas of investigation relevant to the practice of C-MODE at the elementary level that must be pursued. The distance education and research categories provided by Borge Holmberg (as cited in Schlosser & Anderson, 1994) serve as an excellent framework for this investigation. Holmberg suggests eight categories:

- philosophy and theory
- students, their milieu, conditions, and study motivations
- subject-matter presentation

- communication and interaction between students and their supporting organization (tutors, counselors, administrators, other students)
- administration and organization
- economics
- systems (comparative distance education, typologies, evaluation, etc.)
- history

This would seem to be a useful framework upon which those who are interested in investigating this area might build their work.

Conclusion

As we go forward in the new millennium, education providers in both the public and private sectors will be faced with the question of whether, or perhaps only how, to most effectively offer computer-mediated distance education at the elementary level. The next few years are likely to be interesting times for educational institutions and corporations, instructors, and students as they deal with the many new conditions and challenges presented by the availability of this new educational phenomenon.

Challenging, dynamic times, although often perceived as unsettling and disruptive, often serve as excellent opportunities for constructive reflection and the implementation of positive change. It is hoped that this study has in some small way contributed to the ongoing examination of the impact of this potential paradigm shift in how we educate and how young students learn.

References

Barker, B., Frisbie, A., & Patrick, K. (1989). Broadening the definition of distance education in the light of the new telecommunications technologies. The American Journal of Distance Education, 3 (1), 212-213.

Barron, A. E., & Lyskawa, C. (1998). A review of tools for developing and managing online courses [CD-ROM]. SITE '98. Proceedings of the Association for the Advancement of Computing in Education, Washington, DC, 163-165.

Berge, Z. L., & Collins, M. (Eds.). (1998). Wired together: The online classroom in K-12. Cresskill, NJ: Hampton Press.

Brown, A., & Hansen, L. (1998). Software tools for distance learning: The benchmarks project [CD-ROM]. SITE '98. Proceedings of the Association for the Advancement of Computing in Education, Washington, DC, 166a-166b.

Carlson, R. D, Repman, J., Downs, E., & Clark, K. F. (1998). So you want to develop web-based instruction: Points to ponder [CD-ROM]. SITE '98. Proceedings of the Association for the Advancement of Computing in Education, Washington, DC, 141-145.

Cavanaugh, C. S. (1999). The effectiveness of interactive distance learning technologies on K-12 academic achievement, (ERIC Document Reproduction Service No. ED428752)

Chen, Y. J., & Willits, F. K. (1999). Dimensions of educational transactions in a videoconferencing learning environment. The American Journal of Distance Education (13) 1, 45-59.

Clark, R. (1983). Reconsidering research on learning from media. Review of Educational Research, 53 (4), 445-459.

Clark, R. (1994). Media will never influence learning. Educational Technology Research and Development, 42 (4), 21-29.

Crossman, D. M. (1997). The evolution of the World Wide Web as an emerging instructional technology tool. In B. H. Khan. (Ed.), Web-based instruction (pp. 19-23). Englewood Cliffs, NJ: Educational Technology Publications.

Dean, L. M. (1997, November). An evaluation criteria validation model: Stakeholder participation in evaluating a set of criteria. Paper presented at the Annual Conference of the American Evaluation Association, Atlanta, GA.

Denzin, N.K., & Lincoln, Y.S. (Eds.). (1994). Handbook of qualitative research. Newbury Park, CA: Sage.

Edwards, R. (1995). Different discourses, discourses of difference: Globalization, distance education, and open learning. Distance Education, 16 (2), 241-255.

Evans, T. (1995). Globalization, post-Fordism and open and distance education. Distance Education, 16 (2), 256-269.

Everett, D. R. (1998). Taking instruction online: The art of delivery [CD-ROM]. SITE '98. Proceedings of the Association for the Advancement of Computing in Education, Washington, DC, 125-129.

Fagan, P. J. (1997). Assessment of distance education implementation in Iowa: Concerns and indicators of success. In N. J. Maushak, M. Simonson, & K. E. Wright (Eds.), Encyclopedia of distance education research in Iowa (2nd ed., pp. 23-29). Ames, IA: Teacher Education Alliance of the Iowa Distance Education Alliance.

Fanderclai, T. (1995, January). MUDs in education: New environments, new pedagogies. Computer-Mediated Communication Magazine, 2 (1) [Online]. Available: http://sunsite.unc.edu/cmc/mag/1995/jan/fanderclai.html.

Fetterman, D. M. (1996). Videoconferencing on-line: Enhancing communication over the Internet. Educational Researcher, 25 (4), 23-27.

Feyten, C. M., & Nutta, J. N. (Eds.). (1999). Virtual instruction: Issues and insights from an international perspective. Englewood, CO: Libraries Unlimited.

Findley, B., & Findley, D. (1997). Strategies for effective distance education. Contemporary Education, 68 (2), 118-120.

Fraenkel, J. R. & Wallen, N.E. (1996). How to design and evaluate research in education (3rd ed.). New York: McGraw-Hill.

Gardner, H. (1983). Frames of minds: The theory of multiple intelligences. New York: Basic Books.

Gardner, H. (1991). The unschooled mind: How children think and how schools should teach. New York: Basic Books.

Garrison, D. R., & Shale, D. (1987). Mapping the boundaries of distance education: Problems in defining the field. The American Journal of Distance Education 1 (1), 7-13.

Glesne, C., & Peshkin, A. (1992). Becoming a qualitative researcher: An introduction. New York: Longman.

Goodyear, P. (1993, October 22-23). Asynchronous peer interaction in distance education: The evolution of goals, practices, and technology. Proceedings from the Conference on Advances in Integrated Delivery Technologies, Denver, CO.

Hanson, D. (1997). Distance education: Definition, history, status, and theory. In N. J. Maushak, M. Simonson, & K. E. Wright (Eds.), Encyclopedia of distance education research in Iowa (2nd ed.). Ames, IO: Teacher Education Alliance of the Iowa Distance Education Alliance.

Harry, K., & Perraton, H. (2000). Open and distance learning for the new society. In K. Harry (Ed.), Higher education through open and distance learning (pp. 1-12). New York: Routledge.

Hawkes, M., Cambre, M., & Lewis, M. (1998). The Ohio SchoolNet Telecommunity Evaluation (Report No. EP-OTE-P98). Oak Brook, IL: North Central Region Educational Lab.

Hawkridge, D. (1995). The big bang theory in distance education. In F. Lockwood (Ed.), Open and distance learning today (pp. 3-12). London: Routledge.

Holmberg, B. (1986). Growth and structure of distance education. London: Croom Helm.

Holmberg, B. (1995). Theory and practice of distance education. London: Routledge.

Jegede, O. J., & Kirkwood, J. (1994). Student's anxiety in learning through distance education. The American Journal of Distance Education. 15 (2). 279-290.

Jones, A., Kirkup, G., & Kirkwood, A. (1993). Personal computers for distance education: The study of an educational innovation. New York: St. Martins Press.

Keegan, D. (1986). The foundations of distance education (1st ed.). London: Croon Helm.

Keegan, D. (1988). On defining distance education. In D. Stewart, D. Keegan, & B. Holmberg (Eds.), Distance education: International perspectives (pp. 6-33). New York: Routledge.

Keegan, D, (1995). Distance education technology for the new millennium: Compressed video teaching. (ERIC Document Reproduction Service No. ED389931)

Keegan, D. (1996). The foundations of distance education (3rd ed.). London: Routledge.

Khan, B. H. (1997). Web-based instruction (WBI): What is it and why is it? In B. H. Khan (Ed.), Web-based instruction (pp. 5-18). Englewood Cliffs, NJ: Educational Technology Publications.

Kozma, R. (1991). Learning with media. Review of Educational Research, 61 (2), 179-211.

Kozma, R. (1994). Will media influence learning: Reframing the debate. Educational Technology Research and Development Journal, 42 (2), 7-19.

Layton, T. (1997). CyberSchool: Delivering high school credit classes over the Internet. Potlatch, NECC '97. Proceedings of the National Educational Computing Conference, Seattle, 97, 261-263.

Lincoln, Y.S., & Guba, E.G. (1985). Naturalistic inquiry. Beverly Hills, CA: Sage.

Litman, M. (1995). How to measure survey reliability and validity. In The survey kit (7). Thousand Oaks, CA: Sage.

Locatis, C., & Weisberg, M. (1997). Distributed learning and the Internet. Contemporary Education, 68 (2), 100-103.

Lynch, W., Corry, M. (1998). Faculty recruitment, training, and compensation for distance education [CD-ROM]. SITE '98. Proceedings of the Association for the Advancement of Computing in Education, Washington, DC, 171-174.

Mason, E.J., & Bramble, W. J. (1997). Research in education and the behavioral sciences: Concepts and methods. New York: HarperCollins College.

Maushak, N. J. (1997). Distance education: A review of the literature. In N. J. Maushak, M. Simonson, & K. E. Wright (Eds.), Encyclopedia of distance education research in Iowa (2nd ed.). Ames, IO: Teacher Education Alliance of the Iowa Distance Education Alliance.

Maushak, N. J., & Manternach, L. (1997). Iowa Distance Education Alliance. Evaluation Report (Report July 1996 - September 1997). Ames, IO: Iowa State University of Science and Technology, Ames College of Education.

McKenzie, B. K., Kirby, E., Newbill, S.,& Davidson, T. J. (1998). What are the most important teaching behaviours for distance instructors? Perceptions of facilitators, instructors and coordinators [CD-ROM]. SITE '98. Proceedings of the Association for the Advancement of Computing in Education, Washington, DC, 121-124.

McMillan, J.H., & Schumacher, S. (1997). Research in education: A conceptual introduction (3rd & 4th ed.). New York: HarperCollins College.

Merkley, D. J., Bozik, M., & Oakland, K. (1997). Investigating teacher change associated with distance learning in education. In N. J. Maushak, M. Simonson, & K. E. Wright (Eds.), Encyclopedia of Distance education research in Iowa (2nd ed., pp. 31-41). Ames, IO: Teacher Education Alliance of the Iowa Distance Education Alliance.

Meyer-Peyton, L. (2000). Elements of a successful distributed learning program. In L. Lau (Ed.), Distance learning technologies: Issues, trends and opportunities (pp. 82-90). Hershey, PA: Idea Group.

Moore, M. G. (1990). Background and overview of contemporary American distance education. In M. Moore (Ed.), Contemporary issues in American distance education (pp. xii-xxvi). New York: Pergamon Press.

Moore, M. G. (1999). Institutional restructuring: Is distance education like retailing?! The American Journal of Distance Education, 13 1, 1-7.

Moore, M. G., & Kearsley, G. (1996). Distance education: A systems view. Belmont, CA: Wadsworth.

Mortera-Guitierez, F. (1998, January). Distance education in the educational system of Mexico. Paper presented at the Annual Distance Education Conference, Austin, TX.

Mory, E. H., Gambill, L. E., & Browning, J. B. (1998). Instruction on the web: The student's perspective [CD-ROM]. SITE '98. Proceedings of the Association for the Advancement of Computing in Education, Washington, DC, 103-107.

Negroponte, N. (1995). Being digital. New York: Vintage.

Newby, T.J., Stepich, D.A., Lehman, J.D., & Russell, J.D. (1996). Instructional technology for teaching and learning. New Jersey: Prentice-Hall.

Nunnaly, J. (1978). Psychometric theory. New York: McGraw Hill.

Owston, R. D. (1997). The World Wide Web: A technology to enhance teaching and learning? Educational Researcher, 26 (2), 27-33.

Pan, A. (1998). Optimize the web for better instruction [CD-ROM]. SITE '98. Proceedings of the Association for the Advancement of Computing in Education, Washington, DC, 146-149.

Perraron, H. (1988). A theory for distance education. In D. Stewart, D. Keegan, & B. Holmberg (Eds.), Distance education: International perspectives (pp. 6-33). New York: Routledge.

Perraron, H. (2000). Open and distance learning in the developing world. New York: Routledge.

Powers, S. (1997). Three little words: Interactive, distance, and learning. Contemporary Education, 68 (2), 92-93.

Roblyer, M. D., Edwards, J., & Havriluk, M. A. (1997). Integrating educational technology into teaching. Upper Saddle River, NJ: Prentice-Hall.

Romiszowski, A. (1993, June). Telecommunications and distance education. Eric Digest, EDO-IR-93-2.

Ross, S. M., Morrison, G. R., Smith, L. J., & Cleveland, E. (1991). An evaluation of alternative distance tutoring models for at-risk elementary school children. (ERIC Document Reproduction Service No. ED335009)

Rumble, G. (1997). The costs and economics of open and distance learning. London: Kogan Page.

Santoro, G. M. (1998). What is the online classroom? In Z. L. Berge & M. Collins (Eds.), Wired together: The online classroom in K-12, Volume 1: Perspectives and instructional design (pp. 29 - 48). Cresskill, NJ: Hampton Press.

Saskatchewan School Trustees Association. (1995). Distance education network (SSTA Research Centre Report No. 95-10). Regina, SK.: Saskatchewan School Trustees Association Research Centre.

Schlosser, C., & Anderson, M. (1994). Distance education: Review of the literature. Washington DC: Association for Educational Communications and Technology.

Schlough, S., & Suwathana, B. (1998). The development and evaluation of the Internet delivery of the course "Task Analysis" [CD-ROM]. SITE '98. Proceedings of the Association for the Advancement of Computing in Education, Washington, DC, 99-102.

Schrum, L. (2000). Online teaching and learning: Essential conditions for success! In L. Lau (Ed.), Distance learning technologies: Issues, trends and opportunities (pp. 91-106). Hershey, PA: Idea Group.

Shale, D. (2000). University education in Canada. In K. Harry (Ed.), Higher education through open and distance learning (pp. 150-161). New York: Routledge.

Sherry, L., & Wilson, B. (1997). Transformative communication as a stimulus to Web innovations. In B. H. Khan (Ed.), Web-based instruction (pp.67-73). Englewood Cliffs, NJ: Educational Technology Publications.

Simonson, M. (1997). Does anyone really want to learn at a distance? Contemporary Education, 68 (2), 104-107.

Simonson, M., & Schlosser, C. (1995). More than fiber: Distance education in Iowa. Tech Trends, 40 (3), 13-15.

Simonson, M., Schlosser, C., & Hanson, D. (1999). Theory and distance education: A new discussion. The American Journal of Distance Education (13) 1, 61-75.

Sorenson, C. (1997). Distance education: Operational issues. In N. J. Maushak, M. Simonson, & K. E. Wright (Eds.), Encyclopedia of distance education research in Iowa (2nd ed.). Ames, IO: Teacher Education Alliance of the Iowa Distance Education Alliance.

Tiene, D. (1997). Combining distance education and digitized multimedia: Some lessons to be learned. Potlatch, NECC '97. Proceedings of the National Educational Computing Conference, Seattle, 97, 478-481.

Turkle, S. (1995). Life on the screen: Identity in the age of the Internet. New York: Simon and Shuster.

Verduin, J. R, Jr., & Clark, T. A. (1991). Distance education: The foundations of effective practice. San Francisco: Jossey-Bass.

Wellburn, E. (1999). Educational vision, theory, and technology for virtual learning in K-12. In C. M. Feyten & J. W. Nutta (Eds.), Virtual instruction: Issues and insights from an international perspective (pp. 35-63). Englewood, CO: Libraries Unlimited.

Whalen, T., & Wright, D. (1999). Methodology for cost-benefit analysis of Web-based tele-learning: Case study of the Bell Online Institute. The American Journal of Distance Education, 13 (1), 24-44.

Appendix A

Pilot Study Implementation and Practice Questionnaire

Pilot Study

Elementary Computer-mediated Online Distance Education
Effective Implementation and Practice Questionnaire

*** Note: For the purpose of the pilot study please ignore the following instructions and complete the survey based upon your opinions related to the practice of C-MODE at the post-secondary level. It is not necessary to complete the Respondent and Program Information section but you may comment on it if you wish.**

If you are currently engaged in the practice of computer-mediated online distance education (C-MODE) at the **elementary level** we would appreciate it if you would take the time to complete the questionnaire below. Guidelines for the implementation and practice of C-MODE have been extrapolated from the literature dealing with C-MODE at the post-secondary level and the general distance education literature. We would like your assistance in determining which, if any, are specifically applicable to the practice of C-MODE at the elementary level.

The survey is divided into six sections; Respondent & Program Information, Program Guidelines, Instructor Guidelines, Student Guidelines, Organization Guidelines, and Technical Guidelines.

Please complete the the Respondent and Program Information section as asked. Critically examine each of the C-MODE guidelines and then select the number that best describes how you feel about the appropriateness of each statement as a guideline for the successful implementation and practice of C-MODE at the elementary level.

Respondent & Program Information

Respondent

R1. **Employee Group:**

Administrator ☐ Instructor/Teacher ☐ Technician ☐ Other_____

R2. **Gender:**

Male ☐ Female ☐

Program

R3. **Program has been in operation for:**

1 - 12 months ☐ 1 - 2 years ☐ 2 - 3 years ☐ more than 3 years ☐

R4. **Educational Sector:**

Public ☐ Private ☐

R5. **Grades Serviced Online** (Check all that apply):

K ☐, 1 ☐, 2 ☐, 3 ☐, 4 ☐, 5 ☐, 6 ☐, 7 ☐, 8 ☐

R6. **Number of Students at Each Level:**

K , ☐ 1 ☐, 2 ☐, 3 ☐, 4 ☐, 5 ☐, 6 ☐, 7 ☐, 8 ☐

R7. Program **Delivery Methodology** (State percentage of each)

Online ☐ %, Other Distance Method ☐ %, Face-to-Face ☐ %

Pilot Study Criteria Rating Scale

1	2	3	4	5	N	D
Strongly Disagree	Disagree	Neutral or Undecided	Agree	Strongly Agree	Not Applicable	Do Not Understand

Critically examine each of the C-MODE guidelines and then select the number that best describes how you feel about the appropriateness of each statement as a guideline for the successful implementation and practice of C-MODE at the **post-secondary** level.

Program Guidelines

P1. Course design is critical.	1	2	3	4	5	N	D
P2. Clear goals for the program must be established	1	2	3	4	5	N	D
P3. Curriculum development is critical.	1	2	3	4	5	N	D
P4. A team approach should be used to develop course materials.	1	2	3	4	5	N	D
P5. Content specialists, instructional designers, media specialists, as well as writers and editors should be part of the team which develops course materials.	1	2	3	4	5	N	D
P6. Students, instructors, and support staff need to work in concert to produce quality distance education programming.	1	2	3	4	5	N	D
P7. The program must be continually evaluated by the instructors.	1	2	3	4	5	N	D
P8. Participating students must be allowed input in the program evaluation process.	1	2	3	4	5	N	D
P9. The curriculum and educators, and not the technology, must drive the program.	1	2	3	4	5	N	D
P10. The factors which determine learning in a distance education setting are no different than those for traditional settings.	1	2	3	4	5	N	D
P11. A variety of presentation formats using a variety of media should be used.	1	2	3	4	5	N	D
P12. Detailed course outlines should be provided for students.	1	2	3	4	5	N	D
P13. Clear, relevant content should be provided.	1	2	3	4	5	N	D
P14. Experts should be used as course resources.	1	2	3	4	5	N	D
P15. External clues and deadlines must be established to help students keep on-track..	1	2	3	4	5	N	D

P16. A level of convenience in the degree of flexibility afforded in both time and space should be provided.	1	2	3	4	5	N	D
P17. Both individual and group learning experiences must be provided.	1	2	3	4	5	N	D
P18. A wide variety of teaching methods should be used.	1	2	3	4	5	N	D
P19. An attempt to accommodate all learning styles should be made.	1	2	3	4	5	N	D
P20. The program should capitalize on the inherent ability to allow greater individualization of instruction.	1	2	3	4	5	N	D
P21. The program should provide introductory, mid-term and term ending face-to-face meetings where possible.	1	2	3	4	5	N	D
P22. Feedback to students must be ongoing rather than exclusively at grading periods.	1	2	3	4	5	N	D
P23. Postings of comments and answers should be available in an online archive for ongoing review by students and staff.	1	2	3	4	5	N	D
P24. The program should provide images of the instructor and students if possible.	1	2	3	4	5	N	D
P25. Substantial program orientation must be provided.	1	2	3	4	5	N	D
P26. The program should provide at least an equivalent learning experience to being in a class setting.	1	2	3	4	5	N	D

Identify other criteria you believe to be essential **Program** guidelines for the successful implementation and practice of computer-mediated distance education (C-MODE) at the **post-secondary** level or comment on any of the guidelines stated above. Identify the guideline number followed by your comment. Use the back of the page for additional comments.

1-Strongly Disagree 2-Disagree 3-Neutral/Undecided 4-Agree 5-Strongly Agree N-NA D-DNU

Instructor Guidelines

I1. Instructor readiness, with both the curriculum and the technology is important.	1	2	3	4	5	N	D
I2. The instructors' role is changed from primarily being deliverers of instruction to individuals who create learning experiences or guides.	1	2	3	4	5	N	D
I3. Distance instructors require additional planning time.	1	2	3	4	5	N	D
I4. Distance teaching places increased demands on instructors time.	1	2	3	4	5	N	D
I5. Instructors may be required to develop a new set of related skills.	1	2	3	4	5	N	D
I6. Instructors should be certified to teach at the appropriate grade level.	1	2	3	4	5	N	D
I7. Instructors should be qualified to teach specific content.	1	2	3	4	5	N	D
I8. Must be dedicated to the concept of distance education	1	2	3	4	5	N	D
I9. Instructors should be trained in distance education practices.	1	2	3	4	5	N	D
I10. Approval to offer online courses should not be given to instructors until they have demonstrated that they can adapt their teaching to an online setting.	1	2	3	4	5	N	D
I11 Teaching at a distance would allow teachers to be hired from jurisdictions in which they may not reside.	1	2	3	4	5	N	D
I12. Instructors should modify teaching methods, course material and technologies based upon student feelings and coping mechanisms.	1	2	3	4	5	N	D
I13. Instructors require training in dealing with student fears, apprehensions and coping mechanisms related to C-MODE.	1	2	3	4	5	N	D
I14. Instructors need to assist students to make sense of and adapt to the distance learning technology.	1	2	3	4	5	N	D
I15. Instructors may find it necessary to make adjustments to course workload during the course.	1	2	3	4	5	N	D

Identify other criteria you believe to be essential **Instructor** guidelines for the successful implementation and practice of computer-mediated distance education (C-MODE) at the **post-secondary** level or comment on any of the guidelines stated above. Identify the guideline number followed by your comment.

1-Strongly Disagree 2-Disagree 3-Neutral/Undecided 4-Agree 5-Strongly Agree N-NA D-DNU

Student Guidelines

S1. Students may not have the immediate technical skills to deal with online work.	1	2	3	4	5	N	D
S2. Students require opportunities for both individual learning and group learning activities.	1	2	3	4	5	N	D
S3. Students should be allowed some flexibility in the speed at which they proceed with course material.	1	2	3	4	5	N	D
S4. Students will need to develop the ability to be self-disciplined.	1	2	3	4	5	N	D
S5. Students may feel isolated from time to time.	1	2	3	4	5	N	D
S6. Students should be made to feel like they are part of a learning group and are working closely with their peers.	1	2	3	4	5	N	D
S7. Students should be able to interact freely with their peers.	1	2	3	4	5	N	D
S8. Students should have opportunities for direct, informal interaction with their peers.	1	2	3	4	5	N	D
S9. Students should be provided with opportunities for real time communication with peers.	1	2	3	4	5	N	D
S10. Students should be provided with opportunities for real time communication with instructors.	1	2	3	4	5	N	D
S11. Students should be able to communicate readily and directly with the instructor.	1	2	3	4	5	N	D
S12. Students should be provided with opportunities to participate in the ongoing evaluation of their own progress.	1	2	3	4	5	N	D
S13. Students should be provided with opportunities to participate in the ongoing evaluation of the program in which they are enrolled.	1	2	3	4	5	N	D
S14. Students need to participate in regular and frequent activities above and beyond listening, watching or reading.	1	2	3	4	5	N	D
S15. Students benefit from the ability to interact with students from a wide range of different backgrounds.	1	2	3	4	5	N	D
S16. Some students may find it difficult to function in an online environment.	1	2	3	4	5	N	D
S17. Students benefit from being informed about the instructor's expectations and rules and procedures for the distance education class.	1	2	3	4	5	N	D

1-Strongly Disagree 2-Disagree 3-Neutral/Undecided 4-Agree 5-Strongly Agree N-NA D-DNU

S18. The technical, operational problems that sometimes accompany online use, can interfere with the educational experience and lead to frustration for learners. 1 2 3 4 5 N D

S19. Should have the support of their families 1 2 3 4 5 N D

Identify other criteria you believe to be essential **Student** guidelines for the successful implementation and practice of computer-mediated distance education (C-MODE) at the **post-secondary** level or comment on any of the guidelines stated above. Identify the guideline number followed by your comment.

Organizational Guidelines

O1. A high degree of planning is required. 1 2 3 4 5 N D

O2. A systems approach is helpful in planning. 1 2 3 4 5 N D

O3. A high degree of management control is required. 1 2 3 4 5 N D

O4. Excellent communication channels must be established. 1 2 3 4 5 N D

O5. Properly designed and maintained support systems must be established. 1 2 3 4 5 N D

O6. Support personnel provide a vital link between students and teachers. 1 2 3 4 5 N D

O7. Intellectual property rights and royalties need to be addressed. 1 2 3 4 5 N D

O8. Policies concerning use of the technology must be established. 1 2 3 4 5 N D

O9. Policies concerning copyright concerns must be established. 1 2 3 4 5 N D

O10. Policies concerning ethical issues must be established. 1 2 3 4 5 N D

O11. Policies concerning social issues must be established where deemed necessary. 1 2 3 4 5 N D

O12. Organizations need to be sensitive to the fact that the technical, operational problems that sometimes accompany online use, can interfere with the educational experience and lead to 1 2 3 4 5 N D

O13. Organizations need to recognize that scheduling may be a problem where students in different locations (time zones) are being delivered instruction at the same time.	1	2	3	4	5	N	D
O14. Evaluations or assessments should be conducted with new learners to gain an understanding of student knowledge and skill levels.	1	2	3	4	5	N	D
O15. There are often hidden costs for institutions providing the program.	1	2	3	4	5	N	D
O16. Operational costs must be monitored closely to determine true costs.	1	2	3	4	5	N	D
O17. Ongoing upgrades to computer infrastructures may be required.	1	2	3	4	5	N	D
O18. Distance education enterprises need to demonstrate a high degree of fiscal accountability.	1	2	3	4	5	N	D
O19. Market share can be expanded beyond traditional areas through Web based instruction.	1	2	3	4	5	N	D
O20. Administrative support must be provided to instructors if they are to become effective distance educators.	1	2	3	4	5	N	D
O21. Administrative commitment to instructors can be demonstrated in part by salary.	1	2	3	4	5	N	D
O22. Administrative commitment to instructors can be demonstrated in part by time allocations.	1	2	3	4	5	N	D
O23. Administrative commitment to instructors can be demonstrated in part by assurances of job security.	1	2	3	4	5	N	D
O24. Administrative commitment to instructors can be demonstrated in part by involving instructors in the planning and decision making process.	1	2	3	4	5	N	D
O25. It is necessary to provide counseling services that meet the needs of distance learners.	1	2	3	4	5	N	D
O26. Students are increasingly seeking out and requesting distance. learning experiences	1	2	3	4	5	N	D

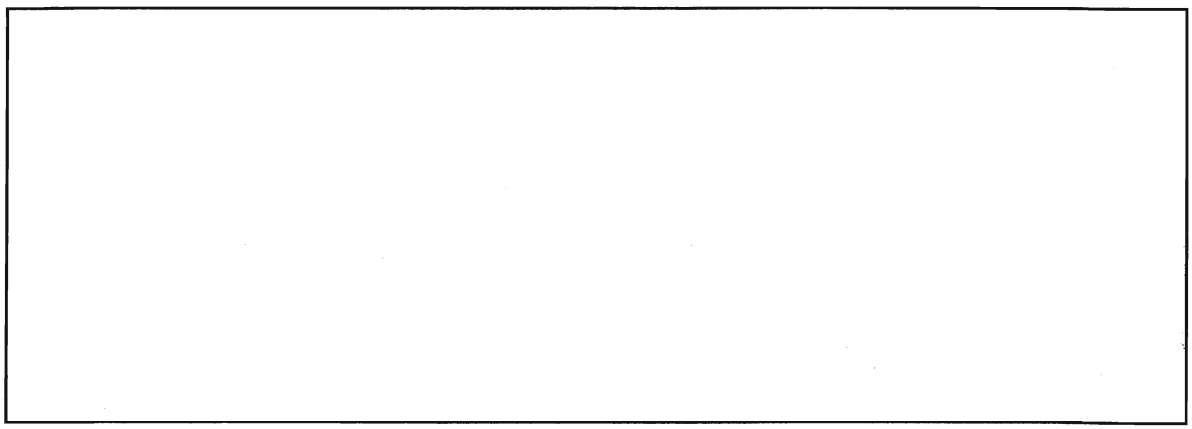
Identify other criteria you believe to be essential **Organization** guidelines for the successful implementation and practice of computer-mediated distance education (C-MODE) at the **post-secondary** level or comment on any of the guidelines stated above. Identify the guideline number followed by your comment.

1-Strongly Disagree 2-Disagree 3-Neutral/Undecided 4-Agree 5-Strongly Agree N-NA D-DNU

Technical Guidelines

T1. The technology must be kept in superior operational condition.	1	2	3	4	5	N	D
T2. Having a well trained, technological staff is essential.	1	2	3	4	5	N	D
T3. Adequate technical support for both students and instructors must be provided.	1	2	3	4	5	N	D
T4. Avoid attempting to be platform specific.	1	2	3	4	5	N	D
T5. Use open technical standards.	1	2	3	4	5	N	D
T6. Use technologies which allow the use of a number of different, individual media.	1	2	3	4	5	N	D
T7. Use technologies which allow for both centralized and decentralized information flow.	1	2	3	4	5	N	D
T8. Use technologies which allow for both centralized or distributed learning.	1	2	3	4	5	N	D
T9. Print based technical instructions should be provided.	1	2	3	4	5	N	D
T10. Substantial software orientation must be provided.	1	2	3	4	5	N	D

Identify other criteria you believe to be essential **Technical** guidelines for the successful implementation and practice of computer-mediated distance education (C-MODE) at the **post-secondary** level or comment on any of the guidelines stated above. Identify the guideline number followed by your comment.



1-Strongly Disagree 2-Disagree 3-Neutral/Undecided 4-Agree 5-Strongly Agree N-NA D-DNU

Appendix B

Pilot Study Letter of Information

February 7, 2001

Name of Potential Participant
Potential Participant's Mailing Address.

RE: Pilot Study for Online Distance Education Survey Instrument

PROJECT TITLE: Elementary Computer-Mediated Online Distance Education: Identification of Criteria for Successful Implementation and Practice

Dear Name of Potential Participant,

I am a Masters of Education student at Brock University, currently conducting thesis research in the area of distance education at the elementary level. As an educator and practitioner of web-based instruction, you are probably aware that an increasing number of boards of education and private virtual schools are offering elementary level online instruction. A review of the literature indicated that very little research has been undertaken in this field. This study will begin to fill that void.

The purpose of my research is to identify criteria which current practitioners of computer-mediated online distance education (C-MODE) at the elementary level, consider to be relevant to its successful implementation and practice. The study is to be conducted by having elementary C-MODE practitioners complete a survey instrument developed specifically for this study. A secondary purpose of the study is the development and refinement of the survey instrument.

I am writing to request your participation in a pilot study that will assess the relevance of the survey instrument. The instrument was developed from criteria identified in distance education literature primarily at the post-secondary level. It is my hope, that by having post-secondary online distance education practitioners review and assist in the refinement of the instrument, it will provide a practical tool with which to begin the investigation of C-MODE at the elementary level. It was necessary to use post-secondary and general distance education criteria to develop the instrument because of the limited amount of work undertaken at the elementary level.

Should you choose to participate in the pilot study, the questionnaire will ask your opinions related to the practice of C-MODE at the post-secondary level, not the elementary level. The survey uses a five point Likert scale. For the purposes of the pilot, the scale also contains N (not applicable)s and D (do not understand) levels to facilitate easier responses. Comments concerning specific statements contained within the instrument, additional statements which you believe should be included, or regarding the entire instrument would be very welcome. The survey should take

between one half hour and one hour depending upon whether you decide to add comments.

The information you provide in the pilot study will be confidential, and will only be used by myself and my thesis advisor for academic purposes. Any written record will be a summarized synthesis of the original responses. Participation in the pilot study is strictly voluntary, and all participants will remain anonymous. There is no anticipated harm for participants. Participants may be contacted for clarification of comments made. This project has been approved by the Brock University Senate Research Ethics Board.

If you are interested in participating in the pilot study, or have any further questions regarding my study, please contact either myself or my faculty supervisor Dr. Jim Kerr. If you know of any other individuals who may be interested in participating in this project please feel free to have them contact me.

Thank you for considering my request.

Sincerely,

W. Greg McCaughey, M.Ed. Student, Faculty of Education, Brock University, St. Catharines, Ontario. gmccaugh@ed.brocku.ca

Dr. Jim Kerr, Associate Professor, Faculty of Education, Brock University, St. Catharines, Ontario. jkerr@ed.brocku.ca or (905) 688-5550, ext. 3148

Appendix C

Pilot Study Informed Consent Form

Pilot Study for Online Distance Education Survey Instrument

BROCK UNIVERSITY FACULTY OF EDUCATION
Informed Consent Form

TITLE OF STUDY: Elementary Computer-Mediated Online Distance Education: Identification of Criteria for Successful Implementation and Practice

RESEARCHERS: W. Greg McCaughey (M.Ed. Student), Dr. Jim Kerr (Associate Professor, Faculty Supervisor)

NAME OF PARTICIPANT: (Please Print) _____

PARTICIPANT CONTACT INFORMATION: (email and/or mailing address)

_____

_____

_____

I understand that this study in which I have agreed to participate will involve the completion of a questionnaire which will ask me to state my opinions related to the practice of computer-mediated online distance education (C-MODE) at the post-secondary level. The purpose of the pilot study is to assess a survey instrument that will be used in a future study to identify criteria which practitioners of C-MODE at the elementary level consider to be relevant to its successful implementation and practice. The survey will take between one half hour and one hour.

I understand that my participation in this study is voluntary and that I may withdraw from the study at any time for any reason.

I understand that there is no obligation to answer any question, or participate in any aspect of this project, that I consider invasive, offensive, or inappropriate.

I understand that all personal data will be kept strictly confidential and that all information will be coded so that my name is not associated with my answers. I understand that only the researchers named above will have access to the data.

I understand that the overall results of the pilot study will be published, and the comments made by participants may be quoted, but any identifying details will be changed, to protect privacy.

PARTICIPANT SIGNATURE: _____ DATE: _____

This study has been reviewed and approved by the Brock Research Ethics Board (File # 00-169, McCaughey). Participants who concerns or questions concerning ethics may contact the Director of the Office of Research Services (905-688-5550, ext. 4315).

If you have any questions or concerns about your participation in the study, you may contact W. Greg McCaughey at gmccaugh@ed.brocku.ca , or Dr. Jim Kerr at jkerr@ed.brocku.ca or (905) 688-5550, ext. 3148.

Feedback about the use of the data will be available during the month of December, 2001, in a web-site established to support this project. A written explanation will be provided to you upon request.

Appendix D

Pilot Study Dean eMail Communication

Dear NAME OF DEAN,

I am a Masters of Education student at Brock University, currently conducting thesis research in the area of computer-mediated distance education. As part of that process, I am contacting practitioners of post-secondary level distance education in Faculties of Education across Canada to ask them to participate in a pilot study related to this project.

The purpose of the pilot study is to seek feedback on the survey instrument I have developed for this project. Although the questionnaire will eventually be used to survey practitioners of elementary distance education, I am asking post-secondary participants to complete and/or comment on the survey based upon their experiences and opinions related to the provision of distance education at the post-secondary level.

The letter of information detailed below provides a broader overview of what would be required of participants. I would appreciate it if you forward this email to faculty members who have either participated in the delivery of online courses or have an interest in this area.

Thank you for your assistance in this matter.

W. Greg McCaughey,
M.Ed. Student,
Faculty of Education,
Brock University,
St. Catharines, ON
gmccaugh@ed.brocku.ca

Pilot Study Letter of Information (Appendix B) inserted here in email.

Appendix E

Pilot Study Faculty eMail Communication

February 7, 2001

RE: Pilot Study for Online Distance Education Survey Instrument

PROJECT TITLE: Elementary Computer-Mediated Online Distance Education: Identification of Criteria for Successful Implementation and Practice

Dear NAME OF POTENTIAL PARTICIPANT,

I am a Masters of Education student at Brock University, currently conducting thesis research in the area of distance education at the elementary level. As an educator and practitioner of web-based instruction, you are probably aware that an increasing number of boards of education and private virtual schools are offering elementary level online instruction. A review of the literature indicated that very little research has been undertaken in this field. This study will begin to fill that void.

The purpose of my research is to identify criteria which current practitioners of computer-mediated online distance education (C-MODE) at elementary level, consider to be relevant to its successful implementation and practice. The study is to be conducted by having elementary C-MODE practitioners complete a survey instrument developed specifically for this study. A secondary purpose of the study is the development and refinement of the survey instrument.

I am writing to request your participation in a pilot study that will assess the relevance of the survey instrument. The instrument was developed from criteria identified in distance education literature primarily at the post-secondary level. It is my hope, that by having post-secondary online distance education practitioners review and assist in the refinement of the instrument, it will provide a practical tool with which to begin the investigation of C-MODE at the elementary level. It was necessary to use post-secondary and general distance education criteria to develop the instrument because of the limited amount o work undertaken at the elementary level.

Should you choose to participate in the pilot study, the questionnaire will ask your opinions related to the practice of C-MODE at the post-secondary level, not the elementary level. The survey uses a five point Likert scale. For the purposes of the pilot, the scale also contains N (not applicable) and D (do not understand) levels to facilitate easier responses. Comments concerning specific statements contained within the instrument, additional statements which you believe should be included, or regarding the entire instrument; would be very welcome. The survey should take between one half hour and one hour depending upon whether you decide to ad comments.

The information you provide in the pilot study will be confidential, and will only be used by myself and my thesis advisor for academic purposes. Any written

record will be a summarized synthesis of the original responses. Participation in the pilot study is strictly voluntary, and all participants will remain anonymous. There is no anticipated harm for participants. Participants may be contacted for clarification of comments made. This project has been approved by the Brock University Senate Research Ethics Board.

If you are interested in participating in the pilot study, or have any further questions regarding my study, please contact either myself or my faculty supervisor Dr. Jim Kerr. If you know of any other individuals who may be interested in participating in this project please feel free to have them contact me.

Thank you for considering my request.

Sincerely,

W. Greg McCaughey, M.Ed. Student, Faculty of Education, Brock University, St. Catharines, Ontario. gmccaugh@ed.brocku.ca

Dr. Jim Kerr, Associate Professor, Faculty of Education, Brock University, St. Catharines, Ontario. jkerr@ed.brocku.ca or (905) 688-5550, ext. 3148

Appendix F

Study Implementation and Practice Questionnaire

Elementary Level Computer-mediated Online Distance Education

Effective Implementation and Practice Questionnaire

If you are currently engaged in the practice of computer-mediated online distance education (C-MODE) at the **elementary level (K-8)** we would appreciate it if you would take the time to complete the following questionnaire. The statements used in this questionnaire have been extrapolated from the literature dealing with C-MODE at the post-secondary level and the general distance education literature. We would like your assistance in determining which, if any, are specifically applicable to the practice of C-MODE at the elementary level.

The survey is divided into six sections; Respondent & Program Information, Program and Course Guidelines, Instructor Guidelines, Student Guidelines, Organization Guidelines, and Technical Guidelines. After completing the Respondent and Program Information section please examine each of the C-MODE guideline statements in the five criteria sections. Then select the number that best describes how you feel about the appropriateness of each statement as a guideline for C-MODE at the elementary level.

In each section you will also be provided with an opportunity to comment on the survey statements or state additional criteria that have not been identified in the survey, which you consider to be essential to the successful implementation and practice of C-MODE at the elementary level.

***Note:**

We would appreciate it if you could complete and mail this survey by October 9, 2001.

Respondent & Program Information

Respondent

R1. **Employee Group** (Check one that applies):

Administrator ☐ Instructor/Teacher ☐ Other (state) _____ ☐

R2. **Gender:** (Check one that applies)

Male ☐ Female ☐

R3. **Years of Experience Practicing/Directing Online Distance Education** (Check one that applies):

1 ☐, 2 ☐, 3 ☐, 4 ☐, 5 ☐, State number if more than 5 ☐

Program

R4. **Program has been in operation for** (Check one that applies):

1 year or less ☐ 2 years ☐ 3 years ☐ more than 3 years ☐

R5. **Educational Sector** (Check one that applies):

Public ☐ Private ☐

R6. **Grades Serviced Online** (Check all that apply):

K ☐, 1 ☐, 2 ☐, 3 ☐, 4 ☐, 5 ☐, 6 ☐, 7 ☐, 8 ☐,

Enrichment/Gifted ☐, Remedial ☐, Other (state) _____ ☐

R7. **Program Delivery Methodology** (State percentage of time students are involved in each):

Online ☐ %, Other Distance Method ☐ %, Face-to-Face ☐ %

Criteria Rating Scale

1	2	3	4	5
Strongly Disagree	Disagree	Neutral or Undecided	Agree	Strongly Agree

Examine each of the C-MODE guidelines and then select the number that best describes how you feel about the appropriateness of each statement as a guideline for the successful implementation and practice of C-MODE at the elementary level.

Program and Course Guidelines

P1. Clear goals for the program must be established.	1	2	3	4	5
P2. The curriculum and educators, and not the technology, must drive the program.	1	2	3	4	5
P3. Administrators, instructors, and support staff need to work in concert to produce quality distance education programming.	1	2	3	4	5
P4. The program must be continually evaluated by administrators and instructors.	1	2	3	4	5
P5. Participating students must be allowed input in the program evaluation process.	1	2	3	4	5
P6. The factors which determine learning in a distance education setting are no different than those for traditional settings.	1	2	3	4	5
P7. A variety of presentation formats using a variety of online media should be used to deliver the program.	1	2	3	4	5
P8. Clear, relevant content should be provided.	1	2	3	4	5
P9. Cues and deadlines must be established to help students keep on-track.	1	2	3	4	5
P10. Both individual and group learning experiences should be provided.	1	2	3	4	5
P11. A variety of teaching methods should be used.	1	2	3	4	5
P12. An attempt to accommodate all learning styles should be made.	1	2	3	4	5
P13. The program should attempt to provide individualized instruction.	1	2	3	4	5
P14. The program should provide occasional face-to-face meetings between students and instructors where possible.	1	2	3	4	5
P15. The program should provide occasional face-to-face meetings between students where possible.	1	2	3	4	5

P16. Feedback to students must be ongoing rather than exclusively at grading periods.	1	2	3	4	5
P17. Postings of assignments should be available in an online archive for ongoing review by students and staff.	1	2	3	4	5
P18. Postings of student work should be available in an online archive for ongoing review by students and staff.	1	2	3	4	5
P19. The program should provide images of the instructor if possible.	1	2	3	4	5
P20. The program should provide images of the students if possible.	1	2	3	4	5
P21. Program orientation must be provided to students.	1	2	3	4	5
P22. Program orientation must be provided to parents.	1	2	3	4	5
P23. Program orientation must be provided to school employees.	1	2	3	4	5
P24. The program should provide both synchronous and asynchronous methods of communication.	1	2	3	4	5
P25. The program should provide at least an equivalent learning experience to being in a class setting.	1	2	3	4	5
P26. Course design is crucial.	1	2	3	4	5
P27. Course curriculum development is crucial.	1	2	3	4	5
P28. A team approach should be used to develop course materials.	1	2	3	4	5
P29. Detailed course outlines should be provided for students.	1	2	3	4	5

Identify other criteria you believe to be essential **Program and Course** guidelines for the successful implementation and practice of computer-mediated distance education (C-MODE) at the elementary level or comment on any of the guidelines stated above. Identify the guideline number followed by your comment. Use the back of the page for additional comments.

1-Strongly Disagree 2-Disagree 3-Neutral or Undecided 4-Agree 5-Strongly Agree

Instructor Guidelines

I1. Instructors must be familiar with the curriculum.	1	2	3	4	5
I2. Instructors must be familiar with the program delivery technology.	1	2	3	4	5
I3. Instructors must be familiar with the technology, as it will be experienced by the student.	1	2	3	4	5
I4. The instructors role is changed from primarily being deliverer of instruction to an individual who creates learning experiences or guides.	1	2	3	4	5
I5. Distance teaching places increased demands on instructor's time.	1	2	3	4	5
I6. Instructors require additional planning time.	1	2	3	4	5
I7. Instructors may be required to develop a new set of related skills.	1	2	3	4	5
I8. Instructors should be certified to teach at the grade level to which they are assigned.	1	2	3	4	5
I9. Instructors should be qualified to teach specific content.	1	2	3	4	5
I10. Instructors must be dedicated to the concept of distance education.	1	2	3	4	5
I11. Instructors should be trained in distance education practices.	1	2	3	4	5
I12. Approval to teach online courses should not be given to instructors until they have demonstrated that they can adapt their teaching to an online setting.	1	2	3	4	5
I13 Teaching at a distance would allow teachers to be hired from jurisdictions in which they may not reside.	1	2	3	4	5
I14. Instructors require sensitivity and compassion in dealing with student fears, apprehensions and coping mechanisms related to C-MODE.	1	2	3	4	5
I15. Instructors need to assist students to make sense of and adapt to the distance learning technology.	1	2	3	4	5
I16. Instructors may find it necessary to make adjustments to student workload during the course.	1	2	3	4	5

Identify other criteria you believe to be essential **Instructor** guidelines for the successful implementation and practice of computer-mediated distance education (C-MODE) at the elementary level or comment on any of the guidelines stated above. Identify the guideline number followed by your comment. Use the back of the page for additional comments.

1-Strongly Disagree 2-Disagree 3-Neutral or Undecided 4-Agree 5-Strongly Agree

Student Guidelines

S1. Students may not have the immediate technical skills to deal with online work.	1	2	3	4	5
S2. Students require opportunities for both individual learning and group learning activities.	1	2	3	4	5
S3. Students should be allowed some flexibility in the speed at which they proceed with course material.	1	2	3	4	5
S4. Students will need to develop the ability to be more self-disciplined.	1	2	3	4	5
S5. Students may feel isolated from time to time.	1	2	3	4	5
S6. Students should be made to feel like they are part of a learning group.	1	2	3	4	5
S7. Students should be made to feel like they are working closely with their peers.	1	2	3	4	5
S8. Students should be able to interact freely with their peers.	1	2	3	4	5
S9. Students should have opportunities for informal interaction with their peers.	1	2	3	4	5
S10. Students should be provided with opportunities for real time (synchronous) communication with their peers.	1	2	3	4	5
S11. Students should be provided with opportunities for real time (synchronous) communication with instructors.	1	2	3	4	5
S12. Students should be able to communicate readily and directly with the instructor.	1	2	3	4	5
S13. Students should be provided with opportunities to participate in the ongoing evaluation of their own progress.	1	2	3	4	5
S14. Students should be provided with opportunities to participate in the ongoing evaluation of the program in which they are enrolled.	1	2	3	4	5
S15. Students need to participate in regular and frequent activities above and beyond watching or reading information on a computer screen.	1	2	3	4	5
S16. Students benefit from the ability to interact with students from a wide range of different backgrounds.	1	2	3	4	5
S17. Some students may find it difficult to function in an online environment.	1	2	3	4	5
S18. Students benefit from being informed about the instructor's expectations and rules and procedures for the distance education class.	1	2	3	4	5

1-Strongly Disagree 2-Disagree 3-Neutral or Undecided 4-Agree 5-Strongly Agree

S19. The technical, operational problems that sometimes accompany online use can interfere with the educational experience and lead to frustration for students.	1	2	3	4	5
S20. Students should have the support of their families.	1	2	3	4	5
S21. Students should be committed to learning in a distance education setting.	1	2	3	4	5

Identify other criteria you believe to be essential **Student** guidelines for the successful implementation and practice of computer-mediated distance education (C-MODE) at the elementary level or comment on any of the guidelines stated above. Identify the guideline number followed by your comment. Use the back of the page for additional comments.

Organizational Guidelines

O1. A high degree of planning is required.	1	2	3	4	5
O2. A high degree of management control is required.	1	2	3	4	5
O3. Excellent communication channels must be established.	1	2	3	4	5
O4. Policies concerning intellectual property rights must be established.	1	2	3	4	5
O5. Policies concerning royalties must be established.	1	2	3	4	5
O6. Policies concerning use of the technology by employees must be established.	1	2	3	4	5
O7. Policies concerning use of the technology by students must be established.	1	2	3	4	5
O8. Policies concerning copyright must be established.	1	2	3	4	5
O9. Policies concerning ethical issues must be established.	1	2	3	4	5
O10. Organizations need to be sensitive to the fact that the technical, operational problems that sometimes accompany online use, can lead to frustration for employees.	1	2	3	4	5
O11. Properly designed and maintained administrative and support systems must be established.	1	2	3	4	5
O12. Support personnel provide a vital link between students and instructors.	1	2	3	4	5

1-Strongly Disagree 2-Disagree 3-Neutral or Undecided 4-Agree 5-Strongly Agree

O13. Scheduling may be a problem where students in different locations (time zones) are being delivered instruction at the same time.	1	2	3	4	5
O14. Evaluations or assessments should be conducted with new learners to gain an understanding of student knowledge and skill levels prior to them commencing participation in the program.	1	2	3	4	5
O15. There are often hidden costs for institutions.	1	2	3	4	5
O16. Operational costs must be monitored closely to determine true costs.	1	2	3	4	5
O17. Ongoing upgrades to computer infrastructures will be required.	1	2	3	4	5
O18. Distance education enterprises need to demonstrate a high degree of fiscal accountability.	1	2	3	4	5
O19. Market share can be expanded beyond traditional areas through Web based instruction.	1	2	3	4	5
O20. Administrative support must be provided to instructors if they are to become effective distance educators.	1	2	3	4	5
O21. Administrative commitment to instructors can be demonstrated in part by salary.	1	2	3	4	5
O22. Administrative commitment to instructors can be demonstrated in part by workload allocations.	1	2	3	4	5
O23. Administrative commitment to instructors can be demonstrated in part by assurances of job security.	1	2	3	4	5
O24. Administrative commitment to instructors can be demonstrated in part by involving instructors in the planning and decision making process.	1	2	3	4	5
O25. Students are increasingly seeking out and requesting distance learning experiences.	1	2	3	4	5
O26. Resources and time must be provided for ongoing staff development.	1	2	3	4	5

Identify other criteria you believe to be essential **Organization** guidelines for the successful implementation and practice of computer-mediated distance education (C-MODE) at the elementary level or comment on any of the guidelines stated above. Identify the guideline number followed by your comment. Use the back of the page for additional comments.

1-Strongly Disagree 2-Disagree 3-Neutral or Undecided 4-Agree 5-Strongly Agree

Technical Guidelines

T1. The program delivery technology must be kept in continual operation.	1	2	3	4	5
T2. Having a well trained, technological staff is essential.	1	2	3	4	5
T3. Technical support for students should be provided.	1	2	3	4	5
T4. Technical support for instructors should be provided.	1	2	3	4	5
T5. Students should be able to participate using any computer platform (Windows, Macintosh, etc.).	1	2	3	4	5
T6. Open technical/software standards (html, PDF, etc.) should be used.	1	2	3	4	5
T7. Technologies which allow the use of a number of different, individual media should be used.	1	2	3	4	5
T8. Technical instructions should be provided (print based or online).	1	2	3	4	5
T9. Software orientation must be provided.	1	2	3	4	5

Identify other criteria you believe to be essential **Technical** guidelines for the successful implementation and practice of computer-mediated distance education (C-MODE) at the elementary level or comment on any of the guidelines stated above. Identify the guideline number followed by your comment. Use the back of the page for additional comments.

1-Strongly Disagree 2-Disagree 3-Neutral or Undecided 4-Agree 5-Strongly Agree

Appendix G

Study Letter of Information

February 7, 2001

Name of Potential Participant
Potential Participant's Mailing Address.

PROJECT TITLE: Elementary Computer-Mediated Online Distance Education: Identification of Criteria for Successful Implementation and Practice

Dear Name of Potential Participant,

I am a Masters of Education student at Brock University, currently conducting thesis research in the area of distance education at the elementary level. As an educator and practitioner of elementary web-based instruction, you are probably aware that an increasing number of boards of education and private virtual schools are offering elementary level instruction online. A review of the literature indicated that very little research has been undertaken in this field. This study will begin to fill that void.

I am writing to request your participation in a study that will develop a preliminary framework of guidelines relating to the effective implementation and practice of C-MODE at the elementary level. It is hoped that this framework can be used by current practitioners to refine their programs and to provide guidance to those seeking to establish new programs.

The study is to be conducted by having elementary C-MODE practitioners complete a survey instrument developed specifically for this study. A secondary purpose of the study is the development and refinement of the survey instrument which may be used in future studies.

Should you choose to participate in the study the questionnaire will ask your opinions related to the practice of C-MODE at the elementary level. The survey uses a five point Likert scale to facilitate easier responses. It has been reviewed, and modified accordingly to reflect their comments, by educators involved in C-MODE at the post-secondary level. Comments concerning specific statements contained within the instrument, additional statements which you believe should be included, or regarding the entire instrument would be very welcome. The survey should take between one half hour and one hour depending upon whether you decide to add comments.

The information you provide in the pilot study will be confidential, and will only be used by myself and my thesis advisor for academic purposes. Any written record will be a summarized synthesis of the original responses. Participation in the study is strictly voluntary, and all participants will remain anonymous. There is no anticipated harm for participants. Participants may be contacted for clarification of

comments made. This project has been approved by the Brock University Senate Research Ethics Board.

You have been contacted because you were identified in your institutions web-site as an individual involved in elementary level C-MODE. If you are interested in participating in the study, or have any further questions regarding my study, please contact either myself or my faculty supervisor Dr. Jim Kerr. Participants for this study are being solicited from individuals involved in the development and/or delivery of C-MODE at the elementary level in North America. If you know of any other organizations or individuals who may be interested in participating in this project please feel free to have them contact me.

Thank you for considering my request.

Sincerely,

W. Greg McCaughey, M.Ed. Student, Faculty of Education, Brock University, St. Catharines, Ontario. gmccaugh@ed.brocku.ca

Dr. Jim Kerr, Associate Professor, Faculty of Education, Brock University, St. Catharines, Ontario. jkerr@ed.brocku.ca or (905) 688-5550, ext. 3148

Appendix H

Study Informed Consent Form

Elementary Computer-Mediated Online Distance Education: Identification of Criteria for Successful Implementation and Practice

BROCK UNIVERSITY FACULTY OF EDUCATION
Informed Consent Form

TITLE OF STUDY: Elementary Computer-Mediated Online Distance Education: Identification of Criteria for Successful Implementation and Practice

RESEARCHERS: W. Greg McCaughey (M.Ed. Student), Dr. Jim Kerr (Associate Professor, Faculty Supervisor)

NAME OF PARTICIPANT: (Please Print) _____

PARTICIPANT CONTACT INFORMATION: (email and/or mailing address)

_____

_____

_____

I understand that this study in which I have agreed to participate will involve the completion of a questionnaire which will ask me to state my opinions related to the practice of computer-mediated online distance education (C-MODE) at the elementary level. This study will develop a preliminary framework of guidelines relating to the effective implementation and practice C-MODE at the elementary level. It is hoped that this framework can be used by current practitioners to refine their programs and to provide guidance to those seeking to establish new programs. The survey will take between one half hour and one hour to complete.

I understand that my participation in this study is voluntary and that I may withdraw from the study at any time for any reason.

I understand that there is no obligation to answer any question, or participate in any aspect of this project, that I consider invasive, offensive, or inappropriate.

I understand that all personal data will be kept strictly confidential and that all information will be coded so that my name is not associated with my answers. I understand that only the researchers named above will have access to the data.

I understand that the overall results of the pilot study will be published, and the comments made by participants may be quoted, but any identifying details will be changed, to protect privacy.

PARTICIPANT SIGNATURE: _____ DATE: _____

This study has been reviewed and approved by the Brock Research Ethics Board (File # _____). Participants who concerns or questions concerning ethics may contact the Director of the Office of Research Services (905-688-5550, ext. 4315).

If you have any questions or concerns about your participation in the study, you may contact W. Greg McCaughey at gmccaugh@ed.brocku.ca , or Dr. Jim Kerr at jkerr@ed.brocku.ca or (905) 688-5550, ext. 3148.

Feedback about the use of the data will be available during the month of December, 2001, in a web-site established to support this project. A written explanation will be provided for you upon request.

Appendix I

Study Program Administrator eMail Communication

June 11, 2001

Dear NAME OF ADMINISTRATOR,

RE: Elementary Online Distance Education Research

PROJECT TITLE: Elementary Computer-Mediated Online Distance Education: Identification of Criteria for Successful Implementation and Practice

I am writing to request your participation, and also the participation of members of your administrative and teaching staff, in a research project related to the practice of web-based elementary education. The letter of information below provides a broader overview of the scope of the project and what would be required of participants. Individuals in your organization who's email addresses have been identified in your web-site will be contacted directly. I would appreciate it if you would forward my request to all other parties.

I realize this request comes at a busy time of the year but my intention is to catch individuals when they are completing an academic year with its events fresh in their minds. The survey will be conducted by mail and I would appreciate having it returned to me by July 16.

If you choose to participate in the study please forward your mailing address when replying to this email. Thank you for your assistance in this matter.

W. Greg McCaughey,
M.Ed. Student,
Faculty of Education,
Brock University,
St. Catharines, Ontario
Canada

gmccaugh@ed.brocku.ca

Study Letter of Information (Appendix G) inserted here in email.

Appendix J

Study Program Administrator Covering Letter

September 4, 2001

Dear NAME,

RE: Elementary Online Distance Education Research

PROJECT TITLE: Elementary Computer-Mediated Online Distance Education: Identification of Criteria for Successful Implementation and Practice

I am writing to request your participation, and also the participation of members of your administrative and teaching staff, in a research project related to the practice of web-based elementary (K-8) education. The attached letter of information provides a broader overview of the scope of the project and what would be required of participants.

I would appreciate it if you would review one of the enclosed survey packages and distribute the rest to members of your organization for their consideration. Individuals who have been identified on your web-site may have been contacted directly. Should you require additional copies please feel free to make them yourself or contact me and I will forward you more.

If you have any questions concerning the survey or the project itself, do not hesitate to contact me at the email address below. Thank you for considering my request.

W. Greg McCaughey,
M.Ed. Student,
Faculty of Education,
Brock University,
St. Catharines, Ontario,
Canada, L2S 3A1

gmccaugh@ed.brocku.ca

Appendix K

Study Program General Covering Letter

September 4, 2001

RE: Elementary Online Distance Education Research

PROJECT TITLE: Elementary Computer-Mediated Online Distance Education: Identification of Criteria for Successful Implementation and Practice

I am writing to request the participation of members of your administrative and teaching staff, in a research project related to the practice of web-based elementary (K-8) education. The attached letter of information provides a broader overview of the scope of the project and what would be required of participants.

I would appreciate it if you would distribute the enclosed survey packages to members of your organization for their consideration. Individuals who have been identified on your web-site may have been contacted directly. Should you require additional copies please feel free to make them yourself or contact me and I will forward you more.

If you have any questions concerning the survey or the project itself, do not hesitate to contact me at the email address below. Thank you for considering my request.

W. Greg McCaughey,
M.Ed. Student,
Faculty of Education,
Brock University,
St. Catharines, Ontario,
Canada, L2S 3A1

gmccaugh@ed.brocku.ca

Appendix L

Study Feedback Letter

Date of Study Completion, 2001

Name Participant
Participant's Mailing Address.

PROJECT TITLE: Elementary Computer-Mediated Online Distance Education: Identification of Criteria for Successful Implementation and Practice

Dear Name of Participant,

I would like to take this opportunity to express my appreciation for your participation in my study. Your involvement has played an important role in the achievement of the goals set out for this project, and to the ongoing investigation of computer-mediated online distance education at the elementary level.

Should you wish to review an executive summary of this project, it can be accessed at (http://siteURL). If you have any additional questions please feel free to contact me at your convenience.

Sincerely,

W. Greg McCaughey, M.Ed. Student, Faculty of Education, Brock University, St. Catharines, Ontario. gmccaugh@ed.brocku.ca

Dr. Jim Kerr, Associate Professor, Faculty of Education, Brock University, St. Catharines, Ontario. jkerr@ed.brocku.ca or (905) 688-5550, ext. 3148

Appendix M

Study Frequency Tables

P1 Clear goals for the program must be established.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	3	18.8	18.8	18.8
	strongly agree	13	81.3	81.3	100.0
	Total	16	100.0	100.0	

P2 The curriculum and educators, and not the technology, must drive the program.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	3	18.8	18.8	18.8
	strongly agree	13		81.3	100.0
	Total	16	100.0	100.0	

P3 Administrators, instructors, and support staff need to work in concert to produce quality distance education programming.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	2	12.5	12.5	12.5
	strongly agree	14	87.5	87.5	100.0
	Total	16	100.0	100.0	

P4 The program must be continually evaluated by administrators and instructors.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	4	25.0	25.0	25.0
	strongly agree	12	75.0	75.0	100.0
	Total	16	100.0	100.0	

P5 Participating students must be allowed input in the program evaluation process.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	neutral	2	12.5	12.5	12.5
	agree	11	68.8	68.8	81.3
	strongly agree	3	18.8	18.8	100.0
	Total	16	100.0	100.0	

P6 The factors which determine learning in a distance education setting are no different than those for traditional settings.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	3	18.8	20.0	20.0
	disagree	5	31.3	33.3	53.3
	neutral	2	12.5	13.3	66.7
	agree	4	25.0	26.7	93.3
	strongly agree	1	6.3	6.7	100.0
	Total	15	93.8	100.0	
Missing	99.00	1	6.3		
Total		16	100.0		

P7 A variety of presentation formats using a variety of online media should be used to deliver the program.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	disagree	1	6.3	6.3	6.3
	neutral	2	12.5	12.5	18.8
	agree	7	43.8	43.8	62.5
	strongly agree	6	37.5	37.5	100.0
	Total	16	100.0	100.0	

P8 Clear, relevant content should be provided.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	4	25.0	25.0	25.0
	strongly agree	12	75.0	75.0	100.0
	Total	16	100.0	100.0	

P9 Cues and deadlines must be established to help students keep on-track.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	neutral	1	6.3	6.3	6.3
	agree	8	50.0	50.0	56.3
	strongly agree	7	43.8	43.8	100.0
	Total	16	100.0	100.0	

P10 Both individual and group learning experiences should be provided.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	neutral	3	18.8	18.8	18.8
	agree	9	56.3	56.3	75.0
	strongly agree	4	25.0	25.0	100.0
	Total	16	100.0	100.0	

P11 A variety of teaching methods should be used.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	neutral	1	6.3	6.3	6.3
	agree	6	37.5	37.5	43.8
	strongly agree	9	56.3	56.3	100.0
	Total	16	100.0	100.0	

P12 An attempt to accommodate all learning styles should be made.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	neutral	2	12.5	12.5	12.5
	agree	7	43.8	43.8	56.3
	strongly agree	7	43.8	43.8	100.0
	Total	16	100.0	100.0	

P13 The program should attempt to provide individualized instruction.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	neutral	3	18.8	18.8	18.8
	agree	6	37.5	37.5	56.3
	strongly agree	7	43.8	43.8	100.0
	Total	16	100.0	100.0	

P14 The program should provide occasional face-to-face meetings between students and instructors where possible.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	disagree	3	18.8	18.8	18.8
	neutral	4	25.0	25.0	43.8
	agree	4	25.0	25.0	68.8
	strongly agree	5	31.3	31.3	100.0
	Total	16	100.0	100.0	

P15 The program should provide occasional face-to-face meetings between students where possible.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	disagree	2	12.5	12.5	12.5
	neutral	5	31.3	31.3	43.8
	agree	7	43.8	43.8	87.5
	strongly agree	2	12.5	12.5	100.0
	Total	16	100.0	100.0	

P16 Feedback to students must be ongoing rather than exclusively at grading periods.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	4	25.0	25.0	25.0
	strongly agree	12	75.0	75.0	100.0
	Total	16	100.0	100.0	

P17 Postings of assignments should be available in an online archive for ongoing review by students and staff.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	neutral	2	12.5	13.3	13.3
	agree	5	31.3	33.3	46.7
	strongly agree	8	50.0	53.3	100.0
	Total	15	93.8	100.0	
Missing	99.00	1	6.3		
Total		16	100.0		

P18 Postings of student work should be available in an online archive for ongoing review by students and staff.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	disagree	1	6.3	6.7	6.7
	neutral	2	12.5	13.3	20.0
	agree	8	50.0	53.3	73.3
	strongly agree	4	25.0	26.7	100.0
	Total	15	93.8	100.0	
Missing	99.00	1	6.3		
Total		16	100.0		

P19 The program should provide images of the instructor if possible.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	1	6.3	6.3	6.3
	neutral	4	25.0	25.0	31.3
	agree	9	56.3	56.3	87.5
	strongly agree	2	12.5	12.5	100.0
	Total	16	100.0	100.0	

P20 The program should provide images of the students if possible.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	1	6.3	6.3	6.3
	disagree	2	12.5	12.5	18.8
	neutral	7	43.8	43.8	62.5
	agree	4	25.0	25.0	87.5
	strongly agree	2	12.5	12.5	100.0
	Total	16	100.0	100.0	

P21 Program orientation must be provided to students.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	5	31.3	31.3	31.3
	strongly agree	11	68.8	68.8	100.0
	Total	16	100.0	100.0	

P22 Program orientation must be provided to parents.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	5	31.3	31.3	31.3
	strongly agree	11	68.8	68.8	100.0
	Total	16	100.0	100.0	

P23 Program orientation must be provided to school employees.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	neutral	1	6.3	6.3	6.3
	agree	6	37.5	37.5	43.8
	strongly agree	9	56.3	56.3	100.0
	Total	16	100.0	100.0	

P24 The program should provide both synchronous and asynchronous methods of communication.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	1	6.3	6.3	6.3
	neutral	4	25.0	25.0	31.3
	agree	6	37.5	37.5	68.8
	strongly agree	5	31.3	31.3	100.0
	Total	16	100.0	100.0	

P25 The program should provide at least an equivalent learning experience to being in a class setting.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	neutral	2	12.5	12.5	12.5
	agree	7	43.8	43.8	56.3
	strongly agree	7	43.8	43.8	100.0
	Total	16	100.0	100.0	

P26 Course design is crucial.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	4	25.0	25.0	25.0
	strongly agree	12	75.0	75.0	100.0
	Total	16	100.0	100.0	

P27 Course curriculum development is crucial.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	2	12.5	12.5	12.5
	strongly agree	14	87.5	87.5	100.0
	Total	16	100.0	100.0	

P28 A team approach should be used to develop course materials.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	disagree	1	6.3	6.3	6.3
	neutral	3	18.8	18.8	25.0
	agree	4	25.0	25.0	50.0
	strongly agree	8	50.0	50.0	100.0
	Total	16	100.0	100.0	

P29 Detailed course outlines should be provided for students.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	5	31.3	31.3	31.3
	strongly agree	11	68.8	68.8	100.0
	Total	16	100.0	100.0	

i1 Instructors must be familiar with the curriculum.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	2	12.5	12.5	12.5
	strongly agree	14	87.5	87.5	100.0
	Total	16	100.0	100.0	

i2 Instructors must be familiar with the program delivery technology.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	4	25.0	26.7	26.7
	strongly agree	11	68.8	73.3	100.0
	Total	15	93.8	100.0	
Missing	99.00	1	6.3		
Total		16	100.0		

i3 Instructors must be familiar with the technology, as it will be experienced by the student.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	5	31.3	31.3	31.3
	strongly agree	11	68.8	68.8	100.0
	Total	16	100.0	100.0	

i4 The instructors role is changed from primarily being deliverer of instruction to an individual who creates learning experiences or guides.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	disagree	2	12.5	12.5	12.5
	neutral	2	12.5	12.5	25.0
	agree	7	43.8	43.8	68.8
	strongly agree	5	31.3	31.3	100.0
	Total	16	100.0	100.0	

i5 Distance teaching places increased demands on instructor's time.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	disagree	2	12.5	12.5	12.5
	neutral	4	25.0	25.0	37.5
	agree	5	31.3	31.3	68.8
	strongly agree	5	31.3	31.3	100.0
	Total	16	100.0	100.0	

i6 Instructors require additional planning time.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	1	6.3	6.3	6.3
	neutral	5	31.3	31.3	37.5
	agree	5	31.3	31.3	68.8
	strongly agree	5	31.3	31.3	100.0
	Total	16	100.0	100.0	

i7 Instructors may be required to develop a new set of related skills.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	7	43.8	46.7	46.7
	strongly agree	8	50.0	53.3	100.0
	Total	15	93.8	100.0	
Missing	99.00	1	6.3		
Total		16	100.0		

i8 Instructors should be certified to teach at the grade level to which they are assigned.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	9	56.3	56.3	56.3
	strongly agree	7	43.8	43.8	100.0
	Total	16	100.0	100.0	

i9 Instructors should be qualified to teach specific content.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	neutral	3	18.8	18.8	18.8
	agree	6	37.5	37.5	56.3
	strongly agree	7	43.8	43.8	100.0
	Total	16	100.0	100.0	

i10 Instructors must be dedicated to the concept of distance education.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	5	31.3	31.3	31.3
	strongly agree	11	68.8	68.8	100.0
	Total	16	100.0	100.0	

i11 Instructors should be trained in distance education practices.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	7	43.8	43.8	43.8
	strongly agree	9	56.3	56.3	100.0
	Total	16	100.0	100.0	

i12 Approval to teach online courses should not be given to instructors until they have demonstrated that they can adapt their teaching to an online setting.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	1	6.3	6.7	6.7
	disagree	1	6.3	6.7	13.3
	neutral	6	37.5	40.0	53.3
	agree	4	25.0	26.7	80.0
	strongly agree	3	18.8	20.0	100.0
	Total	15	93.8	100.0	
Missing	99.00	1	6.3		
Total		16	100.0		

i13 Teaching at a distance would allow teachers to be hired from jurisdictions in which they may not reside.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	12	75.0	75.0	75.0
	strongly agree	4	25.0	25.0	100.0
	Total	16	100.0	100.0	

i14 Instructors require sensitivity and compassion in dealing with student fears, apprehensions and coping mechanisms related to

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	neutral	1	6.3	6.3	6.3
	agree	4	25.0	25.0	31.3
	strongly agree	11	68.8	68.8	100.0
	Total	16	100.0	100.0	

i15 Instructors need to assist students to make sense of and adapt to the distance learning technology.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	neutral	1	6.3	6.3	6.3
	agree	7	43.8	43.8	50.0
	strongly agree	8	50.0	50.0	100.0
	Total	16	100.0	100.0	

i16 Instructors may find it necessary to make adjustments to student workload during the course.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	disagree	1	6.3	6.3	6.3
	agree	8	50.0	50.0	56.3
	strongly agree	7	43.8	43.8	100.0
	Total	16	100.0	100.0	

S1 Students may not have the immediate technical skills to deal with online work.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	7	43.8	43.8	43.8
	strongly agree	9	56.3	56.3	100.0
	Total	16	100.0	100.0	

S2 Students require opportunities for both individual learning and group learning activities.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	neutral	4	25.0	25.0	25.0
	agree	8	50.0	50.0	75.0
	strongly agree	4	25.0	25.0	100.0
	Total	16	100.0	100.0	

S3 Students should be allowed some flexibility in the speed at which they proceed with course material.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	11	68.8	68.8	68.8
	strongly agree	5	31.3	31.3	100.0
	Total	16	100.0	100.0	

S4 Students will need to develop the ability to be more self-disciplined.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	3	18.8	18.8	18.8
	strongly agree	13	81.3	81.3	100.0
	Total	16	100.0	100.0	

S5 Students may feel isolated from time to time.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	neutral	3	18.8	18.8	18.8
	agree	7	43.8	43.8	62.5
	strongly agree	6	37.5	37.5	100.0
	Total	16	100.0	100.0	

S6 Students should be made to feel like they are part of a learning group.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	disagree	1	6.3	6.3	6.3
	neutral	2	12.5	12.5	18.8
	agree	4	25.0	25.0	43.8
	strongly agree	9	56.3	56.3	100.0
	Total	16	100.0	100.0	

S7 Students should be made to feel like they are working closely with their peers.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	disagree	1	6.3	6.3	6.3
	neutral	6	37.5	37.5	43.8
	agree	5	31.3	31.3	75.0
	strongly agree	4	25.0	25.0	100.0
	Total	16	100.0	100.0	

S8 Students should be able to interact freely with their peers.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	neutral	4	25.0	25.0	25.0
	agree	10	62.5	62.5	87.5
	strongly agree	2	12.5	12.5	100.0
	Total	16	100.0	100.0	

S9 Students should have opportunities for informal interaction with their peers.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	neutral	2	12.5	12.5	12.5
	agree	12	75.0	75.0	87.5
	strongly agree	2	12.5	12.5	100.0
	Total	16	100.0	100.0	

S10 Students should be provided with opportunities for real time (synchronous) communication with their peers.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	neutral	4	25.0	25.0	25.0
	agree	9	56.3	56.3	81.3
	strongly agree	3	18.8	18.8	100.0
	Total	16	100.0	100.0	

S11 Students should be provided with opportunities for real time (synchronous) communication with instructors.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	neutral	1	6.3	6.3	6.3
	agree	10	62.5	62.5	68.8
	strongly agree	5	31.3	31.3	100.0
	Total	16	100.0	100.0	

S12 Students should be able to communicate readily and directly with the instructor.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	3	18.8	18.8	18.8
	strongly agree	13	81.3	81.3	100.0
	Total	16	100.0	100.0	

S13 Students should be provided with opportunities to participate in the ongoing evaluation of their own progress.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	disagree	1	6.3	6.3	6.3
	neutral	4	25.0	25.0	31.3
	agree	5	31.3	31.3	62.5
	strongly agree	6	37.5	37.5	100.0
	Total	16	100.0	100.0	

S14 Students should be provided with opportunities to participate in the ongoing evaluation of the program in which they are enrolled.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	neutral	3	18.8	18.8	18.8
	agree	9	56.3	56.3	75.0
	strongly agree	4	25.0	25.0	100.0
	Total	16	100.0	100.0	

S15 Students need to participate in regular and frequent activities above and beyond watching or reading information on a computer screen.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	7	43.8	43.8	43.8
	strongly agree	9	56.3	56.3	100.0
	Total	16	100.0	100.0	

S16 Students benefit from the ability to interact with students from a wide range of different backgrounds.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	neutral	1	6.3	6.3	6.3
	agree	8	50.0	50.0	56.3
	strongly agree	7	43.8	43.8	100.0
	Total	16	100.0	100.0	

S17 Some students may find it difficult to function in an online environment.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	neutral	1	6.3	6.3	6.3
	agree	10	62.5	62.5	68.8
	strongly agree	5	31.3	31.3	100.0
	Total	16	100.0	100.0	

S18 Students benefit from being informed about the instructor's expectations and rules and procedures for the distance education class.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	3	18.8	18.8	18.8
	strongly agree	13	81.3	81.3	100.0
	Total	16	100.0	100.0	

S19 The technical, operational problems that sometimes accompany online use can interfere with the educational experience and lead to frustration for students.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	neutral	1	6.3	6.3	6.3
	agree	8	50.0	50.0	56.3
	strongly agree	7	43.8	43.8	100.0
	Total	16	100.0	100.0	

S20 Students should have the support of their families.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly agree	16	100.0	100.0	100.0

S21 Students should be committed to learning in a distance.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	7	43.8	43.8	43.8
	strongly agree	9	56.3	56.3	100.0
	Total	16	100.0	100.0	

O1 A high degree of planning is required.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	disagree	1	6.3	6.3	6.3
	neutral	1	6.3	6.3	12.5
	agree	5	31.3	31.3	43.8
	strongly agree	9	56.3	56.3	100.0
	Total	16	100.0	100.0	

O2 A high degree of management control is required.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	disagree	2	12.5	12.5	12.5
	neutral	4	25.0	25.0	37.5
	agree	5	31.3	31.3	68.8
	strongly agree	5	31.3	31.3	100.0
	Total	16	100.0	100.0	

O3 Excellent communication channels must be established.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	4	25.0	25.0	25.0
	strongly agree	12	75.0	75.0	100.0
	Total	16	100.0	100.0	

O4 Policies concerning intellectual property rights must be established.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	neutral	3	18.8	18.8	18.8
	agree	8	50.0	50.0	68.8
	strongly agree	5	31.3	31.3	100.0
	Total	16	100.0	100.0	

O5 Policies concerning royalties must be established.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	neutral	4	25.0	25.0	25.0
	agree	8	50.0	50.0	75.0
	strongly agree	4	25.0	25.0	100.0
	Total	16	100.0	100.0	

O6 Policies concerning use of the technology by employees must be established.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	disagree	2	12.5	12.5	12.5
	neutral	3	18.8	18.8	31.3
	agree	7	43.8	43.8	75.0
	strongly agree	4	25.0	25.0	100.0
	Total	16	100.0	100.0	

O7 Policies concerning use of the technology by students must be established.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	disagree	1	6.3	6.7	6.7
	neutral	1	6.3	6.7	13.3
	agree	8	50.0	53.3	66.7
	strongly agree	5	31.3	33.3	100.0
	Total	15	93.8	100.0	
Missing	99.00	1	6.3		
Total		16	100.0		

O8 Policies concerning copyright must be established.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	neutral	3	18.8	18.8	18.8
	agree	6	37.5	37.5	56.3
	strongly agree	7	43.8	43.8	100.0
	Total	16	100.0	100.0	

O9 Policies concerning ethical issues must be established.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	neutral	1	6.3	6.3	6.3
	agree	5	31.3	31.3	37.5
	strongly agree	10	62.5	62.5	100.0
	Total	16	100.0	100.0	

O10 Organizations need to be sensitive to the fact that the technical, operational problems that sometimes accompany online use, can lead to frustration for employees.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	5	31.3	31.3	31.3
	strongly agree	11	68.8	68.8	100.0
	Total	16	100.0	100.0	

O11 Properly designed and maintained administrative and support systems must be established.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	6	37.5	37.5	37.5
	strongly agree	10	62.5	62.5	100.0
	Total	16	100.0	100.0	

O12 Support personnel provide a vital link between students and instructors.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	disagree	1	6.3	6.3	6.3
	neutral	2	12.5	12.5	18.8
	agree	6	37.5	37.5	56.3
	strongly agree	7	43.8	43.8	100.0
	Total	16	100.0	100.0	

O13 Scheduling may be a problem where students in different locations (time zones) are being delivered instruction at the same time.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	1	6.3	6.3	6.3
	neutral	4	25.0	25.0	31.3
	agree	8	50.0	50.0	81.3
	strongly agree	3	18.8	18.8	100.0
	Total	16	100.0	100.0	

O14 Evaluations or assessments should be conducted with new learners to gain an understanding of student knowledge and skill levels prior to them commencing participation in the program.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	1	6.3	6.3	6.3
	neutral	3	18.8	18.8	25.0
	agree	7	43.8	43.8	68.8
	strongly agree	5	31.3	31.3	100.0
	Total	16	100.0	100.0	

O15 There are often hidden costs for institutions.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	neutral	4	25.0	26.7	26.7
	agree	5	31.3	33.3	60.0
	strongly agree	6	37.5	40.0	100.0
	Total	15	93.8	100.0	
Missing	99.00	1	6.3		
Total		16	100.0		

O16 Operational costs must be monitored closely to determine true costs.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	disagree	1	6.3	6.7	6.7
	neutral	1	6.3	6.7	13.3
	agree	7	43.8	46.7	60.0
	strongly agree	6	37.5	40.0	100.0
	Total	15	93.8	100.0	
Missing	99.00	1	6.3		
Total		16	100.0		

O17 Ongoing upgrades to computer infrastructures will be required.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	neutral	1	6.3	6.7	6.7
	agree	5	31.3	33.3	40.0
	strongly agree	9	56.3	60.0	100.0
	Total	15	93.8	100.0	
Missing	99.00	1	6.3		
Total		16	100.0		

O18 Distance education enterprises need to demonstrate a high degree of fiscal accountability.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	neutral	2	12.5	12.5	12.5
	agree	8	50.0	50.0	62.5
	strongly agree	6	37.5	37.5	100.0
	Total	16	100.0	100.0	

O19 Market share can be expanded beyond traditional areas through Web based instruction.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	1	6.3	6.3	6.3
	neutral	2	12.5	12.5	18.8
	agree	8	50.0	50.0	68.8
	strongly agree	5	31.3	31.3	100.0
	Total	16	100.0	100.0	

O20 Administrative support must be provided to instructors if they are to become effective distance educators.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	neutral	1	6.3	6.7	6.7
	agree	7	43.8	46.7	53.3
	strongly agree	7	43.8	46.7	100.0
	Total	15	93.8	100.0	
Missing	99.00	1	6.3		
Total		16	100.0		

O21 Administrative commitment to instructors can be demonstrated in part by salary.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	1	6.3	6.7	6.7
	neutral	3	18.8	20.0	26.7
	agree	6	37.5	40.0	66.7
	strongly agree	5	31.3	33.3	100.0
	Total	15	93.8	100.0	
Missing	99.00	1	6.3		
Total		16	100.0		

O22 Administrative commitment to instructors can be demonstrated in part by workload allocations.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	6	37.5	37.5	37.5
	strongly agree	10	62.5	62.5	100.0
	Total	16	100.0	100.0	

O22 Administrative commitment to instructors can be demonstrated in part by workload allocations.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	6	37.5	37.5	37.5
	strongly agree	10	62.5	62.5	100.0
	Total	16	100.0	100.0	

O23 Administrative commitment to instructors can be demonstrated in part by assurances of job security.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	neutral	4	25.0	25.0	25.0
	agree	7	43.8	43.8	68.8
	strongly agree	5	31.3	31.3	100.0
	Total	16	100.0	100.0	

O24 Administrative commitment to instructors can be demonstrated in part by involving instructors in the planning and decision making process.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	7	43.8	43.8	43.8
	strongly agree	9	56.3	56.3	100.0
	Total	16	100.0	100.0	

O25 Students are increasingly seeking out and requesting distance learning experiences.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	neutral	4	25.0	26.7	26.7
	agree	9	56.3	60.0	86.7
	strongly agree	2	12.5	13.3	100.0
	Total	15	93.8	100.0	
Missing	99.00	1	6.3		
Total		16	100.0		

O26 Resources and time must be provided for ongoing staff development.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	7	43.8	43.8	43.8
	strongly agree	9	56.3	56.3	100.0
	Total	16	100.0	100.0	

T1 The program delivery technology must be kept in continual operation.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	neutral	2	12.5	12.5	12.5
	agree	3	18.8	18.8	31.3
	strongly agree	11	68.8	68.8	100.0
	Total	16	100.0	100.0	

T2 Having a well trained, technological staff is essential.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	neutral	1	6.3	6.3	6.3
	agree	3	18.8	18.8	25.0
	strongly agree	12	75.0	75.0	100.0
	Total	16	100.0	100.0	

T3 Technical support for students should be provided.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	neutral	1	6.3	6.7	6.7
	agree	3	18.8	20.0	26.7
	strongly agree	11	68.8	73.3	100.0
	Total	15	93.8	100.0	
Missing	99.00	1	6.3		
Total		16	100.0		

T4 Technical support for instructors should be provided.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	3	18.8	20.0	20.0
	strongly agree	12	75.0	80.0	100.0
	Total	15	93.8	100.0	
Missing	99.00	1	6.3		
Total		16	100.0		

T5 Students should be able to participate using any computer platform (Windows, Macintosh, etc.)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	disagree	1	6.3	6.3	6.3
	neutral	1	6.3	6.3	12.5
	agree	7	43.8	43.8	56.3
	strongly agree	7	43.8	43.8	100.0
	Total	16	100.0	100.0	

T6 Open technical/software standards (html, PDF, etc.) should be used.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	1	6.3	6.3	6.3
	neutral	2	12.5	12.5	18.8
	agree	7	43.8	43.8	62.5
	strongly agree	6	37.5	37.5	100.0
	Total	16	100.0	100.0	

T7 Technologies which allow the use of a number of different, individual media should be used.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	strongly disagree	1	6.3	6.3	6.3
	neutral	2	12.5	12.5	18.8
	agree	7	43.8	43.8	62.5
	strongly agree	6	37.5	37.5	100.0
	Total	16	100.0	100.0	

T8 Technical instructions should be provided (print based or online).

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	agree	5	31.3	31.3	31.3
	strongly agree	11	68.8	68.8	100.0
	Total	16	100.0	100.0	

T9 Software orientation must be provided.

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	neutral	2	12.5	12.5	12.5
	agree	4	25.0	25.0	37.5
	strongly agree	10	62.5	62.5	100.0
	Total	16	100.0	100.0	

Appendix N

Study Descriptive Statistics

Note. N - number of responses, Min. - lowest individual score given, Max. - highest individual score given, Mean - mean of all responses, SD- standard deviation

	N	Min.	Max.	Mean	Std. Dev.
P1 Clear goals for the program must be established.	16	4.00	5.00	4.8125	.4031
P2 The curriculum and educators, and not the technology, must drive the program.	16	4.00	5.00	4.8125	.4031
P3 Administrators, instructors, and support staff need to work in concert to produce quality distance education programming.	16	4.00	5.00	4.8750	.3416
P4 The program must be continually evaluated by administrators and instructors.	16	4.00	5.00	4.7500	.4472
P5 Participating students must be allowed input in the program evaluation process.	16	3.00	5.00	4.0625	.5737
P6 The factors which determine learning in a distance education setting are no different than those for traditional settings.	15	1.00	5.00	2.6667	1.2910
P7 A variety of presentation formats using a variety of online media should be used to deliver the program.	16	2.00	5.00	4.1250	.8851
P8 Clear, relevant content should be provided.	16	4.00	5.00	4.7500	.4472
P9 Cues and deadlines must be established to help students keep on-track.	16	3.00	5.00	4.3750	.6191
P10 Both individual and group learning experiences should be provided.	16	3.00	5.00	4.0625	.6801
P11 A variety of teaching methods should be used.	16	3.00	5.00	4.5000	.6325
P12 An attempt to accommodate all learning styles should be made.	16	3.00	5.00	4.3125	.7042
P13 The program should attempt to provide individualized instruction.	16	3.00	5.00	4.2500	.7746
P14 The program should provide occasional face-to-face meetings between students and instructors where possible.	16	2.00	5.00	3.6875	1.1383
P15 The program should provide occasional face-to-face meetings between students where possible.	16	2.00	5.00	3.5625	.8921
P16 Feedback to students must be ongoing rather than exclusively at grading periods.	16	4.00	5.00	4.7500	.4472
P17 Postings of assignments should be available in an online archive for ongoing review by students and staff.	15	3.00	5.00	4.4000	.7368

	N	Min.	Max.	Mean	Std. Dev.
P18 Postings of student work should be available in an online archive for ongoing review by students and staff.	15	2.00	5.00	4.0000	.8452
P19 The program should provide images of the instructor if possible.	16	1.00	5.00	3.6875	.9465
P20 The program should provide images of the students if possible.	16	1.00	5.00	3.2500	1.0646
P21 Program orientation must be provided to students.	16	4.00	5.00	4.6875	.4787
P22 Program orientation must be provided to parents.	16	4.00	5.00	4.6875	.4787
P23 Program orientation must be provided to school employees.	16	3.00	5.00	4.5000	.6325
P24 The program should provide both synchronous and asynchronous methods of communication.	16	1.00	5.00	3.8750	1.0878
P25 The program should provide at least an equivalent learning experience to being in a class setting.	16	3.00	5.00	4.3125	.7042
P26 Course design is crucial.	16	4.00	5.00	4.7500	.4472
P27 Course curriculum development is crucial.	16	4.00	5.00	4.8750	.3416
P28 A team approach should be used to develop course materials.	16	2.00	5.00	4.1875	.9811
P29 Detailed course outlines should be provided for students.	16	4.00	5.00	4.6875	.4787
i1 Instructors must be familiar with the curriculum.	16	4.00	5.00	4.8750	.3416
i2 Instructors must be familiar with the program delivery technology.	15	4.00	5.00	4.7333	.4577
i3 Instructors must be familiar with the technology, as it will be experienced by the student.	16	4.00	5.00	4.6875	.4787
i4 The instructors role is changed from primarily being deliverer of instruction to an individual who creates learning experiences or guides.	16	2.00	5.00	3.9375	.9979
i5 Distance teaching places increased demands on instructor's time.	16	2.00	5.00	3.8125	1.0468
i6 Instructors require additional planning time.	16	1.00	5.00	3.8125	1.1087
i7 Instructors may be required to develop a new set of related skills.	15	4.00	5.00	4.5333	.5164
i8 Instructors should be certified to teach at the grade level to which they are assigned.	16	4.00	5.00	4.4375	.5123
i9 Instructors should be qualified to teach specific content.	16	3.00	5.00	4.2500	.7746
i10 Instructors must be dedicated to the concept of distance education.	16	4.00	5.00	4.6875	.4787

	N	Min.	Max.	Mean	Std. Dev.
i11 Instructors should be trained in distance education practices.	16	4.00	5.00	4.5625	.5123
i12 Approval to teach online courses should not be given to instructors until they have demonstrated that they can adapt their teaching to an online setting.	15	1.00	5.00	3.4667	1.1255
i13 Teaching at a distance would allow teachers to be hired from jurisdictions in which they may not reside.	16	4.00	5.00	4.2500	.4472
i14 Instructors require sensitivity and compassion in dealing with student fears, apprehensions and coping mechanisms related to	16	3.00	5.00	4.6250	.6191
i15 Instructors need to assist students to make sense of and adapt to the distance learning technology.	16	3.00	5.00	4.4375	.6292
i16 Instructors may find it necessary to make adjustments to student workload during the course.	16	2.00	5.00	4.3125	.7932
S1 Students may not have the immediate technical skills to deal with online work.	16	4.00	5.00	4.5625	.5123
S2 Students require opportunities for both individual learning and group learning activities.	16	3.00	5.00	4.0000	.7303
S3 Students should be allowed some flexibility in the speed at which they proceed with course material.	16	4.00	5.00	4.3125	.4787
S4 Students will need to develop the ability to be more self-disciplined.	16	4.00	5.00	4.8125	.4031
S5 Students may feel isolated from time to time.	16	3.00	5.00	4.1875	.7500
S6 Students should be made to feel like they are part of a learning group.	16	2.00	5.00	4.3125	.9465
S7 Students should be made to feel like they are working closely with their peers.	16	2.00	5.00	3.7500	.9309
S8 Students should be able to interact freely with their peers.	16	3.00	5.00	3.8750	.6191
S9 Students should have opportunities for informal interaction with their peers.	16	3.00	5.00	4.0000	.5164
S10 Students should be provided with opportunities for real time (synchronous) communication with their peers.	16	3.00	5.00	3.9375	.6801
S11 Students should be provided with opportunities for real time (synchronous) communication with instructors.	16	3.00	5.00	4.2500	.5774
S12 Students should be able to communicate readily and directly with the instructor.	16	4.00	5.00	4.8125	.4031
S13 Students should be provided with opportunities to participate in the ongoing evaluation of their own progress.	16	2.00	5.00	4.0000	.9661

	N	Min.	Max.	Mean	Std. Dev.
S14 Students should be provided with opportunities to participate in the ongoing evaluation of the program in which they are enrolled.	16	3.00	5.00	4.0625	.6801
S15 Students need to participate in regular and frequent activities above and beyond watching or reading information on a computer screen.	16	4.00	5.00	4.5625	.5123
S16 Students benefit from the ability to interact with students from a wide range of different backgrounds.	16	3.00	5.00	4.3750	.6191
S17 Some students may find it difficult to function in an online environment.	16	3.00	5.00	4.2500	.5774
S18 Students benefit from being informed about the instructor's expectations and rules and procedures for the distance education class.	16	4.00	5.00	4.8125	.4031
S19 The technical, operational problems that sometimes accompany online use can interfere with the educational experience and lead to frustration for students.	16	3.00	5.00	4.3750	.6191
S20 Students should have the support of their families.	16	5.00	5.00	5.0000	.0000
S21 Students should be committed to learning in a distance.	16	4.00	5.00	4.5625	.5123
O1 A high degree of planning is required.	16	2.00	5.00	4.3750	.8851
O2 A high degree of management control is required.	16	2.00	5.00	3.8125	1.0468
O3 Excellent communication channels must be established.	16	4.00	5.00	4.7500	.4472
O4 Policies concerning intellectual property rights must be established.	16	3.00	5.00	4.1250	.7188
O5 Policies concerning royalties must be established.	16	3.00	5.00	4.0000	.7303
O6 Policies concerning use of the technology by employees must be established.	16	2.00	5.00	3.8125	.9811
O7 Policies concerning use of the technology by students must be established.	15	2.00	5.00	4.1333	.8338
O8 Policies concerning copyright must be established.	16	3.00	5.00	4.2500	.7746
O9 Policies concerning ethical issues must be established.	16	3.00	5.00	4.5625	.6292
O10 Organizations need to be sensitive to the fact that the technical, operational problems that sometimes accompany online use, can lead to frustration for employees.	16	4.00	5.00	4.6875	.4787
O11 Properly designed and maintained administrative and support systems must be established.	16	4.00	5.00	4.6250	.5000

	N	Min.	Max.	Mean	Std. Dev.
O12 Support personnel provide a vital link between students and instructors.	16	2.00	5.00	4.1875	.9106
O13 Scheduling may be a problem where students in different locations (time zones) are being delivered instruction at the same time.	16	1.00	5.00	3.7500	1.0000
O14 Evaluations or assessments should be conducted with new learners to gain an understanding of student knowledge and skill levels prior to them commencing participation in the program.	16	1.00	5.00	3.9375	1.0626
O15 There are often hidden costs for institutions.	15	3.00	5.00	4.1333	.8338
O16 Operational costs must be monitored closely to determine true costs.	15	2.00	5.00	4.2000	.8619
O17 Ongoing upgrades to computer infrastructures will be required.	15	3.00	5.00	4.5333	.6399
O18 Distance education enterprises need to demonstrate a high degree of fiscal accountability.	16	3.00	5.00	4.2500	.6831
O19 Market share can be expanded beyond traditional areas through Web based instruction.	16	1.00	5.00	4.0000	1.0328
O20 Administrative support must be provided to instructors if they are to become effective distance educators.	15	3.00	5.00	4.4000	.6325
O21 Administrative commitment to instructors can be demonstrated in part by salary.	15	1.00	5.00	3.9333	1.0998
O22 Administrative commitment to instructors can be demonstrated in part by workload allocations.	16	4.00	5.00	4.6250	.5000
O23 Administrative commitment to instructors can be demonstrated in part by assurances of job security.	16	3.00	5.00	4.0625	.7719
O24 Administrative commitment to instructors can be demonstrated in part by involving instructors in the planning and decision making process.	16	4.00	5.00	4.5625	.5123
O25 Students are increasingly seeking out and requesting distance learning experiences.	15	3.00	5.00	3.8667	.6399
O26 Resources and time must be provided for ongoing staff development.	16	4.00	5.00	4.5625	.5123
T1 The program delivery technology must be kept in continual operation.	16	3.00	5.00	4.5625	.7274
T2 Having a well trained, technological staff is essential.	16	3.00	5.00	4.6875	.6021
T3 Technical support for students should be provided.	15	3.00	5.00	4.6667	.6172
T4 Technical support for instructors should be provided.	15	4.00	5.00	4.8000	.4140

	N	Min.	Max.	Mean	Std. Dev.
T5 Students should be able to participate using any computer platform (Windows, Macintosh, etc.)	16	2.00	5.00	4.2500	.8563
T6 Open technical/software standards (html, PDF, etc.) should be used.	16	1.00	5.00	4.0625	1.0626
T7 Technologies which allow the use of a number of different, individual media should be used.	16	1.00	5.00	4.0625	1.0626
T8 Technical instructions should be provided (print based or online).	16	4.00	5.00	4.6875	.4787
T9 Software orientation must be provided.	16	3.00	5.00	4.5000	.7303

Note. N - number of responses, Min. - lowest individual score given, Max. - highest individual score given, Mean - mean of all responses, SD- standard deviation

Appendix O

Study Descriptive Statistics Sorted by Descending Mean

	N	Min.	Max.	Mean	Std. Dev.
S20 Students should have the support of their families.	16	5	5	5	0
P3 Administrators, instructors, and support staff need to work in concert to produce quality distance education programming.	16	4	5	4.875	0.3416
P27 Course curriculum development is crucial.	16	4	5	4.875	0.3416
i1 Instructors must be familiar with the curriculum.	16	4	5	4.875	0.3416
P1 Clear goals for the program must be established.	16	4	5	4.8125	0.4031
P2 The curriculum and educators, and not the technology, must drive the program.	16	4	5	4.8125	0.4031
S4 Students will need to develop the ability to be more self-disciplined.	16	4	5	4.8125	0.4031
S12 Students should be able to communicate readily and directly with the instructor.	16	4	5	4.8125	0.4031
S18 Students benefit from being informed about the instructor's expectations and rules and procedures for the distance education class.	16	4	5	4.8125	0.4031
T4 Technical support for instructors should be provided.	15	4	5	4.8	0.414
P4 The program must be continually evaluated by administrators and instructors.	16	4	5	4.75	0.4472
P8 Clear, relevant content should be provided.	16	4	5	4.75	0.4472
P16 Feedback to students must be ongoing rather than exclusively at grading periods.	16	4	5	4.75	0.4472
P26 Course design is crucial.	16	4	5	4.75	0.4472
O3 Excellent communication channels must be established.	16	4	5	4.75	0.4472
i2 Instructors must be familiar with the program delivery technology.	15	4	5	4.7333	0.4577
P21 Program orientation must be provided to students.	16	4	5	4.6875	0.4787
P22 Program orientation must be provided to parents.	16	4	5	4.6875	0.4787
P29 Detailed course outlines should be provided for students.	16	4	5	4.6875	0.4787
i3 Instructors must be familiar with the technology, as it will be experienced by the student.	16	4	5	4.6875	0.4787

	N	Min.	Max.	Mean	Std. Dev.
i10 Instructors must be dedicated to the concept of distance education.	16	4	5	4.6875	0.4787
O10 Organizations need to be sensitive to the fact that the technical, operational problems that sometimes accompany online use, can lead to frustration for employees.	16	4	5	4.6875	0.4787
T8 Technical instructions should be provided (print based or online).	16	4	5	4.6875	0.4787
T2 Having a well trained, technological staff is essential.	16	3	5	4.6875	0.6021
T3 Technical support for students should be provided.	15	3	5	4.6667	0.6172
O11 Properly designed and maintained administrative and support systems must be established.	16	4	5	4.625	0.5
O22 Administrative commitment to instructors can be demonstrated in part by workload allocations.	16	4	5	4.625	0.5
i14 Instructors require sensitivity and compassion in dealing with student fears, apprehensions and coping mechanisms related to	16	3	5	4.625	0.6191
i11 Instructors should be trained in distance education practices.	16	4	5	4.5625	0.5123
S1 Students may not have the immediate technical skills to deal with online work.	16	4	5	4.5625	0.5123
S15 Students need to participate in regular and frequent activities above and beyond watching or reading information on a computer screen.	16	4	5	4.5625	0.5123
S21 Students should be committed to learning in a distance.	16	4	5	4.5625	0.5123
O24 Administrative commitment to instructors can be demonstrated in part by involving instructors in the planning and decision making process.	16	4	5	4.5625	0.5123
O26 Resources and time must be provided for ongoing staff development.	16	4	5	4.5625	0.5123
O9 Policies concerning ethical issues must be established.	16	3	5	4.5625	0.6292
T1 The program delivery technology must be kept in continual operation.	16	3	5	4.5625	0.7274
i7 Instructors may be required to develop a new set of related skills.	15	4	5	4.5333	0.5164
O17 Ongoing upgrades to computer infrastructures will be required.	15	3	5	4.5333	0.6399
P11 A variety of teaching methods should be used.	16	3	5	4.5	0.6325

	N	Min.	Max.	Mean	Std. Dev.
P23 Program orientation must be provided to school employees.	16	3	5	4.5	0.6325
T9 Software orientation must be provided.	16	3	5	4.5	0.7303
i8 Instructors should be certified to teach at the grade level to which they are assigned.	16	4	5	4.4375	0.5123
i15 Instructors need to assist students to make sense of and adapt to the distance learning technology.	16	3	5	4.4375	0.6292
O20 Administrative support must be provided to instructors if they are to become effective distance educators.	15	3	5	4.4	0.6325
P17 Postings of assignments should be available in an online archive for ongoing review by students and staff.	15	3	5	4.4	0.7368
P9 Cues and deadlines must be established to help students keep on-track.	16	3	5	4.375	0.6191
S16 Students benefit from the ability to interact with students from a wide range of different backgrounds.	16	3	5	4.375	0.6191
S19 The technical, operational problems that sometimes accompany online use can interfere with the educational experience and lead to frustration for students.	16	3	5	4.375	0.6191
O1 A high degree of planning is required.	16	2	5	4.375	0.8851
S3 Students should be allowed some flexibility in the speed at which they proceed with course material.	16	4	5	4.3125	0.4787
P12 An attempt to accommodate all learning styles should be made.	16	3	5	4.3125	0.7042
P25 The program should provide at least an equivalent learning experience to being in a class setting.	16	3	5	4.3125	0.7042
i16 Instructors may find it necessary to make adjustments to student workload during the course.	16	2	5	4.3125	0.7932
S6 Students should be made to feel like they are part of a learning group.	16	2	5	4.3125	0.9465
i13 Teaching at a distance would allow teachers to be hired from jurisdictions in which they may not reside.	16	4	5	4.25	0.4472
S11 Students should be provided with opportunities for real time (synchronous) communication with instructors.	16	3	5	4.25	0.5774

	N	Min.	Max.	Mean	Std. Dev.
S17 Some students may find it difficult to function in an online environment.	16	3	5	4.25	0.5774
O18 Distance education enterprises need to demonstrate a high degree of fiscal accountability.	16	3	5	4.25	0.6831
P13 The program should attempt to provide individualized instruction.	16	3	5	4.25	0.7746
i9 Instructors should be qualified to teach specific content.	16	3	5	4.25	0.7746
O8 Policies concerning copyright must be established.	16	3	5	4.25	0.7746
T5 Students should be able to participate using any computer platform (Windows, Macintosh, etc.)	16	2	5	4.25	0.8563
O16 Operational costs must be monitored closely to determine true costs.	15	2	5	4.2	0.8619
S5 Students may feel isolated from time to time.	16	3	5	4.1875	0.75
O12 Support personnel provide a vital link between students and instructors.	16	2	5	4.1875	0.9106
P28 A team approach should be used to develop course materials.	16	2	5	4.1875	0.9811
O15 There are often hidden costs for institutions.	15	3	5	4.1333	0.8338
O7 Policies concerning use of the technology by students must be established.	15	2	5	4.1333	0.8338
O4 Policies concerning intellectual property rights must be established.	16	3	5	4.125	0.7188
P7 A variety of presentation formats using a variety of online media should be used to deliver the program.	16	2	5	4.125	0.8851
P5 Participating students must be allowed input in the program evaluation process.	16	3	5	4.0625	0.5737
P10 Both individual and group learning experiences should be provided.	16	3	5	4.0625	0.6801
S14 Students should be provided with opportunities to participate in the ongoing evaluation of the program in which they are enrolled.	16	3	5	4.0625	0.6801
O23 Administrative commitment to instructors can be demonstrated in part by assurances of job security.	16	3	5	4.0625	0.7719
T6 Open technical/software standards (html, PDF, etc.) should be used.	16	1	5	4.0625	1.0626
T7 Technologies which allow the use of a number of different, individual media should be used.	16	1	5	4.0625	1.0626
S9 Students should have opportunities for informal interaction with their peers.	16	3	5	4	0.5164

	N	Min.	Max.	Mean	Std. Dev.
S2 Students require opportunities for both individual learning and group learning activities.	16	3	5	4	0.7303
O5 Policies concerning royalties must be established.	16	3	5	4	0.7303
P18 Postings of student work should be available in an online archive for ongoing review by students and staff.	15	2	5	4	0.8452
S13 Students should be provided with opportunities to participate in the ongoing evaluation of their own progress.	16	2	5	4	0.9661
O19 Market share can be expanded beyond traditional areas through Web based instruction.	16	1	5	4	1.0328
S10 Students should be provided with opportunities for real time (synchronous) communication with their peers.	16	3	5	3.9375	0.6801
i4 The instructors role is changed from primarily being deliverer of instruction to an individual who creates learning experiences or guides.	16	2	5	3.9375	0.9979
O14 Evaluations or assessments should be conducted with new learners to gain an understanding of student knowledge and skill levels prior to them commencing participation in the program.	16	1	5	3.9375	1.0626
O21 Administrative commitment to instructors can be demonstrated in part by salary.	15	1	5	3.9333	1.0998
S8 Students should be able to interact freely with their peers.	16	3	5	3.875	0.6191
P24 The program should provide both synchronous and asynchronous methods of communication.	16	1	5	3.875	1.0878
O25 Students are increasingly seeking out and requesting distance learning experiences.	15	3	5	3.8667	0.6399
O6 Policies concerning use of the technology by employees must be established.	16	2	5	3.8125	0.9811
i5 Distance teaching places increased demands on instructor's time.	16	2	5	3.8125	1.0468
O2 A high degree of management control is required.	16	2	5	3.8125	1.0468
i6 Instructors require additional planning time.	16	1	5	3.8125	1.1087
S7 Students should be made to feel like they are working closely with their peers.	16	2	5	3.75	0.9309
O13 Scheduling may be a problem where students in different locations (time zones) are being delivered instruction at the same time.	16	1	5	3.75	1

	N	Min.	Max.	Mean	Std. Dev.
P19 The program should provide images of the instructor if possible.	16	1	5	3.6875	0.9465
P14 The program should provide occasional face-to-face meetings between students and instructors where possible.	16	2	5	3.6875	1.1383
P15 The program should provide occasional face-to-face meetings between students where possible.	16	2	5	3.5625	0.8921
i12 Approval to teach online courses should not be given to instructors until they have demonstrated that they can adapt their teaching to an online setting.	15	1	5	3.4667	1.1255
P20 The program should provide images of the students if possible.	16	1	5	3.25	1.0646
P6 The factors which determine learning in a distance education setting are no different than those for traditional settings.	15	1	5	2.6667	1.291

Appendix P

Revised Study Implementation and Practice Questionnaire

Elementary Level Computer-mediated Online Distance Education

Effective Implementation and Practice Questionnaire

If you are currently engaged in the practice of computer-mediated online distance education (C-MODE) at the **elementary level (K-8)** we would appreciate it if you would take the time to complete the following questionnaire. The statements used in this questionnaire have been extrapolated from the literature dealing with C-MODE at the post-secondary level and the general distance education literature. We would like your assistance in determining which, if any, are specifically applicable to the practice of C-MODE at the elementary level.

The survey is divided into six sections; Respondent & Program Information, Program and Course Guidelines, Instructor Guidelines, Student Guidelines, Organization Guidelines, and Technical Guidelines. After completing the Respondent and Program Information section please examine each of the C-MODE guideline statements in the five criteria sections. Then select the number that best describes how you feel about the appropriateness of each statement as a guideline for C-MODE at the elementary level.

In each section you will also be provided with an opportunity to comment on the survey statements or state additional criteria that have not been identified in the survey, which you consider to be essential to the successful implementation and practice of C-MODE at the elementary level.

Respondent & Program Information

Respondent

R1. **Employee Group** (Check one that applies):

Administrator ☐ Instructor/Teacher ☐ Other (state) _____ ☐

R2. **Gender:** (Check one that applies)

Male ☐ Female ☐

R3. **Years of Experience Practicing/Directing Online Distance Education** (Check one that applies):

1 ☐, 2 ☐, 3 ☐, 4 ☐, 5 ☐, State number if more than 5 ☐

Program

R4. **Program has been in operation for** (Check one that applies):

1 year or less ☐ 2 years ☐ 3 years ☐ more than 3 years ☐

R5. **Educational Sector** (Check one that applies):

Public ☐ Private ☐

R6. **Grades Serviced Online** (Check all that apply):

K ☐, 1 ☐, 2 ☐, 3 ☐, 4 ☐, 5 ☐, 6 ☐, 7 ☐, 8 ☐,

Enrichment/Gifted ☐, Remedial ☐, Other (state) _____ ☐

R7. **Program Delivery Methodology** (State percentage of time students are involved in each):

Online ☐ %, Other Distance Method ☐ %, Face-to-Face ☐ %

Criteria Rating Scale

1	2	3	4	5
Strongly Disagree	**Disagree**	**Neutral or Undecided**	**Agree**	**Strongly Agree**

Examine each of the C-MODE guidelines and then select the number that best describes how you feel about the appropriateness of each statement as a guideline for the successful implementation and practice of C-MODE at the elementary level.

Program and Course Guidelines

P1. Clear goals for the program must be established.	1	2	3	4	5
P2. The curriculum and educators, and not the technology, must drive the program.	1	2	3	4	5
P3. Administrators, instructors, and support staff need to work in concert to produce quality distance education programming.	1	2	3	4	5
P4. The program must be continually evaluated by administrators and instructors.	1	2	3	4	5
P5. The factors which determine learning in a distance education setting are no different than those for traditional settings.	1	2	3	4	5
P6. A variety of presentation formats using a variety of online media should be used to deliver the program.	1	2	3	4	5
P7. Clear, relevant content should be provided.	1	2	3	4	5
P8. A variety of teaching methods should be used.	1	2	3	4	5
P9. Program orientation must be provided to school employees.	1	2	3	4	5
P10. The program should provide both synchronous and asynchronous methods of communication.	1	2	3	4	5

1-Strongly Disagree 2-Disagree 3-Neutral or Undecided 4-Agree 5-Strongly Agree

P11. The program should provide at least an equivalent learning experience to being in a class setting.	**1**	**2**	**3**	**4**	**5**
P12. Course design is crucial.	**1**	**2**	**3**	**4**	**5**
P13. Course curriculum development is crucial.	**1**	**2**	**3**	**4**	**5**
P14. A team approach should be used to develop course materials.	**1**	**2**	**3**	**4**	**5**

Identify other criteria you believe to be essential **Program and Course** guidelines for the successful implementation and practice of computer-mediated distance education (C-MODE) at the elementary level or comment on any of the guidelines stated above. Identify the guideline number followed by your comment. Use the back of the page for additional comments.

Instructor Guidelines

I1. Instructors must be familiar with the curriculum.	**1**	**2**	**3**	**4**	**5**
I2. Instructors must be familiar with the program delivery technology.	**1**	**2**	**3**	**4**	**5**
I3. Instructors must be familiar with the technology, as it will be experienced by the student.	**1**	**2**	**3**	**4**	**5**
I4. The instructors role is changed from primarily being deliverer of instruction to an individual who creates learning experiences or guides.	**1**	**2**	**3**	**4**	**5**

1-Strongly Disagree 2-Disagree 3-Neutral or Undecided 4-Agree 5-Strongly Agree

I5. Distance teaching places increased demands on instructor's time.	1	2	3	4	5
I6. Instructors require additional planning time.	1	2	3	4	5
I7. Instructors may be required to develop a new set of related skills.	1	2	3	4	5
I8. Instructors should be certified to teach at the grade level to which they are assigned.	1	2	3	4	5
I9. Instructors should be qualified to teach specific content.	1	2	3	4	5
I10. Instructors must be dedicated to the concept of distance education.	1	2	3	4	5
I11. Instructors should be trained in distance education practices.	1	2	3	4	5
I12. Approval to teach online courses should not be given to instructors until they have demonstrated that they can adapt their teaching to an online setting.	1	2	3	4	5
I13. Teaching at a distance would allow teachers to be hired from jurisdictions in which they may not reside.	1	2	3	4	5
I14. Instructors require sensitivity and compassion in dealing with student fears, apprehensions and coping mechanisms related to C-MODE.	1	2	3	4	5
I15. Instructors need to assist students to make sense of and adapt to the distance learning technology.	1	2	3	4	5
I16. Instructors may find it necessary to make adjustments to student workload during the course.	1	2	3	4	5
I17. The program should provide images of the instructor if possible.	1	2	3	4	5
I18. Administrative support must be provided to instructors if they are to become effective distance educators.	1	2	3	4	5
I19. Administrative commitment to instructors can be demonstrated in part by salary.	1	2	3	4	5
I20. Administrative commitment to instructors can be demonstrated in part by workload allocations.	1	2	3	4	5
I21. Administrative commitment to instructors can be demonstrated in part by assurances of job security.	1	2	3	4	5

1-Strongly Disagree 2-Disagree 3-Neutral or Undecided 4-Agree 5-Strongly Agree

I22. Administrative commitment to instructors can be demonstrated in part by involving instructors in the planning and decision making process.	**1**	**2**	**3**	**4**	**5**
I23. Resources and time must be provided for ongoing staff development.	**1**	**2**	**3**	**4**	**5**

Identify other criteria you believe to be essential **Instructor** guidelines for the successful implementation and practice of computer-mediated distance education (C-MODE) at the elementary level or comment on any of the guidelines stated above. Identify the guideline number followed by your comment. Use the back of the page for additional comments.

Student Guidelines

S1. Students may not have the immediate technical skills to deal with online work.	**1**	**2**	**3**	**4**	**5**
S2. Students require opportunities for both individual learning and group learning activities.	**1**	**2**	**3**	**4**	**5**
S3. Students should be allowed some flexibility in the speed at which they proceed with course material.	**1**	**2**	**3**	**4**	**5**
S4. Students will need to develop the ability to be more self-disciplined.	**1**	**2**	**3**	**4**	**5**
S5. Students may feel isolated from time to time.	**1**	**2**	**3**	**4**	**5**

1-Strongly Disagree 2-Disagree 3-Neutral or Undecided 4-Agree 5-Strongly Agree

S6. Students should be made to feel like they are part of a learning group.	1	2	3	4	5
S7. Students should be made to feel like they are working closely with their peers.	1	2	3	4	5
S8. Students should be able to interact freely with their peers.	1	2	3	4	5
S9. Students should have opportunities for informal interaction with their peers.	1	2	3	4	5
S10. Students should be provided with opportunities for real time (synchronous) communication with their peers.	1	2	3	4	5
S11. Students should be provided with opportunities for real time (synchronous) communication with instructors.	1	2	3	4	5
S12. Students should be able to communicate readily and directly with the instructor.	1	2	3	4	5
S13. Students should be provided with opportunities to participate in the ongoing evaluation of their own progress.	1	2	3	4	5
S14. Students should be provided with opportunities to participate in the ongoing evaluation of the program in which they are enrolled.	1	2	3	4	5
S15. Students need to participate in regular and frequent activities above and beyond watching or reading information on a computer screen.	1	2	3	4	5
S16. Students benefit from the ability to interact with students from a wide range of different backgrounds.	1	2	3	4	5
S17. Some students may find it difficult to function in an online environment.	1	2	3	4	5
S18. Students benefit from being informed about the instructor's expectations and rules and procedures for the distance education class.	1	2	3	4	5
S19. The technical, operational problems that sometimes accompany online use can interfere with the educational experience and lead to frustration for students.	1	2	3	4	5
S20. Students should be committed to learning in a distance education setting.	1	2	3	4	5
S21. Cues and deadlines must be established to help students keep on-track.	1	2	3	4	5

1-Strongly Disagree 2-Disagree 3-Neutral or Undecided 4-Agree 5-Strongly Agree

S22. An attempt to accommodate all learning styles should be made.	1	2	3	4	5
S23. The program should attempt to provide individualized instruction.	1	2	3	4	5
S24. The program should provide occasional face-to-face meetings between students and instructors where possible.	1	2	3	4	5
S25. The program should provide occasional face-to-face meetings between students where possible.	1	2	3	4	5
S26. Feedback to students must be ongoing rather than exclusively at grading periods.	1	2	3	4	5
S27. Postings of assignments should be available in an online archive for ongoing review by students and staff.	1	2	3	4	5
S28. Postings of student work should be available in an online archive for ongoing review by students and staff.	1	2	3	4	5
S29. The program should provide images of the students if possible.	1	2	3	4	5
S30. Program orientation must be provided to students.	1	2	3	4	5
S31. Detailed course outlines should be provided for students.	1	2	3	4	5

Identify other criteria you believe to be essential **Student** guidelines for the successful implementation and practice of computer-mediated distance education (C-MODE) at the elementary level or comment on any of the guidelines stated above. Identify the guideline number followed by your comment. Use the back of the page for additional comments.

1-Strongly Disagree 2-Disagree 3-Neutral or Undecided 4-Agree 5-Strongly Agree

Organizational Guidelines

O1. A high degree of planning is required.	1	2	3	4	5
O2. A high degree of management control is required.	1	2	3	4	5
O3. Excellent communication channels must be established.	1	2	3	4	5
O4. Policies concerning intellectual property rights must be established.	1	2	3	4	5
O5. Policies concerning royalties must be established.	1	2	3	4	5
O6. Policies concerning use of the technology by employees must be established.	1	2	3	4	5
O7. Policies concerning use of the technology by students must be established.	1	2	3	4	5
O8. Policies concerning copyright must be established.	1	2	3	4	5
O9. Policies concerning ethical issues must be established.	1	2	3	4	5
O10. Organizations need to be sensitive to the fact that the technical, operational problems that sometimes accompany online use, can lead to frustration for employees.	1	2	3	4	5
O11. Properly designed and maintained administrative and support systems must be established.	1	2	3	4	5
O12. Support personnel provide a vital link between students and instructors.	1	2	3	4	5
O13. Scheduling may be a problem where students in different locations (time zones) are being delivered instruction at the same time.	1	2	3	4	5
O14. Evaluations or assessments should be conducted with new learners to gain an understanding of student knowledge and skill levels prior to them commencing participation in the program.	1	2	3	4	5
O15. There are often hidden costs for institutions.	1	2	3	4	5
O16. Operational costs must be monitored closely to determine true costs.	1	2	3	4	5
O17. Ongoing upgrades to computer infrastructures will be required.	1	2	3	4	5

1-Strongly Disagree 2-Disagree 3-Neutral or Undecided 4-Agree 5-Strongly Agree

O18. Distance education enterprises need to demonstrate a high degree of fiscal accountability.	**1**	**2**	**3**	**4**	**5**
O19. Market share can be expanded beyond traditional areas through Web based instruction.	**1**	**2**	**3**	**4**	**5**

Identify other criteria you believe to be essential **Organization** guidelines for the successful implementation and practice of computer-mediated distance education (C-MODE) at the elementary level or comment on any of the guidelines stated above. Identify the guideline number followed by your comment. Use the back of the page for additional comments.

Parent Guidelines

Pa1. Parents need to provide a high level of support to students enrolled in C-MODE programs.	**1**	**2**	**3**	**4**	**5**
Pa2. Program orientation must be provided to parents.	**1**	**2**	**3**	**4**	**5**
Pa3. Parents are increasingly seeking out and requesting distance learning experiences for their children.	**1**	**2**	**3**	**4**	**5**
Pa4. Parents need to be committed to the C-MODE concept.	**1**	**2**	**3**	**4**	**5**
Pa5. Parents need to be trained in the technical requirements of C-MODE.	**1**	**2**	**3**	**4**	**5**

1-Strongly Disagree 2-Disagree 3-Neutral or Undecided 4-Agree 5-Strongly Agree

Pa6. Parents need to be trained to academically support the student.	**1**	**2**	**3**	**4**	**5**
Pa7. Parents need to be trained to psychologically and emotionally support the student.	**1**	**2**	**3**	**4**	**5**
Pa8. Parents need to develop a strong working relationship with their child's online instructor.	**1**	**2**	**3**	**4**	**5**
Pa9. Parents need to develop a strong working relationship with the the online school.	**1**	**2**	**3**	**4**	**5**

Identify other criteria you believe to be essential **Parent** guidelines for the successful implementation and practice of computer-mediated distance education (C-MODE) at the elementary level or comment on any of the guidelines stated above. Identify the guideline number followed by your comment. Use the back of the page for additional comments.

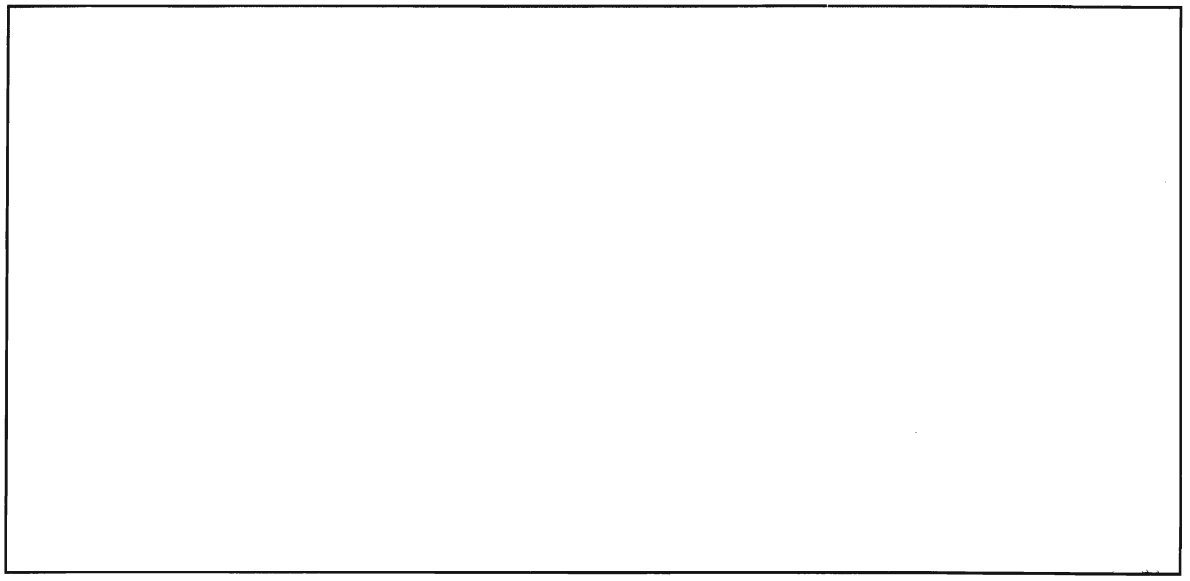
Technical Guidelines

T1. The program delivery technology must be kept in continual operation.	**1**	**2**	**3**	**4**	**5**
T2. Having a well trained, technological staff is essential.	**1**	**2**	**3**	**4**	**5**
T3. Technical support for students should be provided.	**1**	**2**	**3**	**4**	**5**
T4. Technical support for instructors should be provided.	**1**	**2**	**3**	**4**	**5**

1-Strongly Disagree 2-Disagree 3-Neutral or Undecided 4-Agree 5-Strongly Agree

T5. Students should be able to participate using any computer platform (Windows, Macintosh, etc.).	**1**	**2**	**3**	**4**	**5**
T6. Open technical/software standards (html, PDF, etc.) should be used.	**1**	**2**	**3**	**4**	**5**
T7. Technologies which allow the use of a number of different, individual media should be used.	**1**	**2**	**3**	**4**	**5**
T8. Technical instructions should be provided (print based or online).	**1**	**2**	**3**	**4**	**5**
T9. Software orientation must be provided.	**1**	**2**	**3**	**4**	**5**

Identify other criteria you believe to be essential **Technical** guidelines for the successful implementation and practice of computer-mediated distance education (C-MODE) at the elementary level or comment on any of the guidelines stated above. Identify the guideline number followed by your comment. Use the back of the page for additional comments.



1-Strongly Disagree 2-Disagree 3-Neutral or Undecided 4-Agree 5-Strongly Agree

Appendix Q

Brock University Ethics Approval

Subject: 00-169, McCaughey - Approved
Date: Wed, 07 Feb 2001 10:39:26 -0500
From: Deborah Van Oosten <dvanoost@spartan.ac.brocku.ca>
To: jkerr@ed.BrockU.CA, gregmccaughey@home.com
CC: dbmarley@spartan.ac.brocku.ca, mowen@spartan.ac.brocku.ca

Senate Research Ethics
Board
Extensions 3205/4315, Room C315

FROM: David Butz, Chair
Senate Research Ethics Board (REB)

TO: Jim Kerr, Education
W. Greg McCaughey

FILE: 00-169, McCaughey

DATE: February 7, 2001

The Brock University Research Ethics Board has reviewed the research proposal:

Elementary Computer-Mediated Online Distance Education: Identification of Criteria for Successful Implementation and Practice

The Subcommittee finds that your proposal conforms to the Brock University guidelines set out for ethical research.

** Accepted as is.

Please note: If Changes or Modifications are required to this approved research, they must be reviewed and approved by the committee. If so, please complete form #5 - Request for Ethics Clearance of a Revision or Modification to an Ongoing application for Ethics Review of Research with Human Participants and submit it to the Chair of the Research Ethics Board. You can download this form from the Office of Research Services or visit the web site:
http://www.BrockU.CA/researchservices/mainethicsformpage.html

DB/dvo

****
Deborah Van Oosten - Brock University
Administrative Assistant
Office of Research Services
http://www.brocku.ca/researchservices/
phone: (905)688-5550, ext. 4315
fax: (905)688-0748
email: dvanoost@spartan.ac.brocku.ca
****