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## Computer mediated communication: Elements impacting sustained usage by Iowa elementary and middle school teachers

Philip M. Hibbard  
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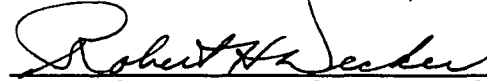
COMPUTER MEDIATED COMMUNICATION:  
ELEMENTS IMPACTING SUSTAINED USAGE BY IOWA  
ELEMENTARY AND MIDDLE SCHOOL TEACHERS

A Dissertation  
Submitted  
In Partial Fulfillment  
of the Requirements for the Degree  
Doctor of Education

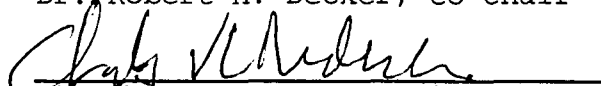
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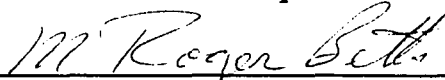
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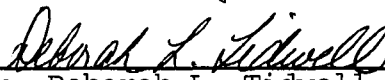
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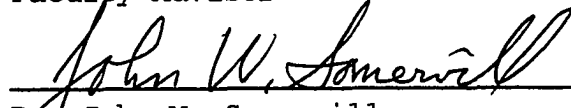
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## ABSTRACT

The purpose of the study was to examine, using a case study methodology, interactions among a group of Iowa teachers involved in a computer mediated communication project, to better understand those elements which may impact sustained usage of computer mediated communication. The study involved examination of one year's worth of on-line journal postings and interactive conferences, and interviews with the 22 teachers involved in the project.

The multiple sources of data collected were analyzed using a methodology known as constant comparative, and the analysis presented according to the following themes:

1. What topics did the participants discuss while using computer mediated communication?

2. Were there differences in language used by the teachers in the weekly journals versus the on-line conferences?

3. What were the reflective responses of these teachers when questioned about their involvement with computer mediated communication?

The study found that topics of discussion evolving from the teacher's use of computer mediated communication fell into four areas: social, school related, class related, and personal. The study also found a significant difference in the language used by the teachers in their weekly journals versus the on-line conferences. Analysis of the reflective

responses to the interview questions revealed behavioral or attitudinal patterns in the areas of home use, frequency of use, sharing of experiences, relevance to teaching, viability for inservice activities, time commitment, and support.

Examination of the above findings revealed differences impacting sustained usage in the areas of gender, the teachers' perception of the innovative aspects of the new technology, and their attitude toward time commitment.

Recommendations were made in the areas of (a) time for integration of new technologies, (b) working collaboratively, (c) technical support, (d) school district commitment, (e) funding, and (f) additional research.

## CHAPTER I

## INTRODUCTION

Background

Considerable research has been done regarding communication processes among teachers. One conclusion is that teachers often feel isolated from their peers due to the unique nature of the classroom (Driscoll, 1983; Engelking, 1986; Jackson & Boles, 1982; Rothberg, 1984).

Hunter (1990) stated that:

Teacher collaboration with other teachers and with other people both inside and outside of the school community is increasingly recognized as necessary for achieving such important and urgent goals as increased professionalism and continuing education of teachers, school restructuring, and reform of curricula, instructional strategies, and assessment methods. A rapidly growing number of teachers are using computer-based communications networks - both local and remote - to access information, facilitate such collaborations, and to build new local, regional, national, and international communities. (p. 1)

In introducing herself to members of a listserv (an electronic mailing list), J. Tammen (personal communication, email from KIDSPHERE@vms.cis.pitt.EDU, January 6, 1994) explained one of the reasons she finds computer mediated communication valuable:

I'm a high school English teacher who just hooked up to Internet this fall. Since getting on this mailing list I read my e-mail every day because there are on average 25 messages from educators or students around the world every day. Sometimes I reply, sometimes I learn something, often I simply read and delete the message. I feel much more connected to educators since getting on line. That's important because teaching can be a very isolated profession.

The Iowa Technology Commission (1993) stated that:

Technology can provide all educators with powerful resources--professional development, continuing education, support from mentors, researchers, or other educators in similar situations--reducing the isolation felt by many educators. (p. 1)

Computer mediated communication (CMC) is a method of enhancing communication by providing means by which participants need not meet in the same location or even at the same time. CMC has been employed extensively in business and industry for interaction among employees at local and remote sites. Fryer and Furger (1993) stated that "every day more than 10 million business professionals rely on electronic mail to communicate with co-workers" (p. 167).

Within the education field, local computer mediated communication has barely begun, and remote CMC is extremely rare. While a body of research is developing concerning CMC for student interactions, little has been done regarding CMC for teacher collaboration. Harasim (1990) included a bibliography containing over 300 citations on the subject of educational computer mediated communications; only half a dozen of these focused on teachers' usage.

#### Purpose

The purpose of this study was to examine, using a case study methodology, interactions among a group of teachers involved in a computer mediated communications project in Iowa herein referred to as Carver III, to better understand those elements which may impact sustained usage of computer



mediated communication. For purposes of this study, sustained usage refers to whether or not the teachers attained the level of "hooked user" as defined by Tovey, Savicki, and White (1990).

#### Rationale for a Case Study Approach

Tovey et al. (1990) stated, a "question [regarding computer mediated communication] that will be asked over and over again is, 'How can we get more people involved?'" (p. 117). A similarly posed question might be "how can we keep people involved?"

The researcher for this study had the opportunity to examine interactions among a group of teachers in Iowa who were embarking on a one-to-two year project utilizing computer mediated communication. Only interactions from the first year of the project were included in this study.

The project presented a unique opportunity to study contemporary events wherein the relevant behaviors cannot be manipulated. This set of conditions is what Yin (1990) described as being particularly relevant for the case study strategy, allowing "an investigation to retain the holistic and meaningful characteristics of real-life events" (p. 14).

#### Population and Sample

A group of 23 teachers from Iowa were participating in a Carver/NGS America Online Project, referred to as Carver III. The goals of this project had to do with increasing teachers' skills in using technology for educational purposes;

enhancing teachers' professionalism by linking them to a broader universe of educators and resource materials; providing greater flexibility in the way in which staff development takes place and encouraging greater interaction among teachers of various disciplines.

Teachers were selected who exhibited both an interest in and competence with educational technologies. Additionally, participants were required to have access to a computer (either Macintosh or Apple II series), telephone line, and modem. Each teacher also agreed to attend a one-day training workshop and a follow-up workshop. The teachers were provided free access to America Online and were reimbursed for long distance telephone charges if a local connection was not available.

In addition to the 23 teachers involved there were a number of project faculty who provided guidance and training throughout. Faculty members included a representative from the National Geographic Society, an Iowa director for the project, and four lead teachers. While interactions from the faculty may be seen in some areas of the research, faculty input was not included in this study.

Each project participant was required to attend two on-line conferences each semester, and submit a weekly on-line journal. Analyses of these conferences and journals provided insight as to factors demonstrating levels of success with CMC.

### Research Themes

The following initial research themes were utilized to focus and guide the investigation:

1. What topics did the participants discuss while using computer mediated communication? These topics evolved from analysis of the journal postings and conferences and interviews which were conducted with each participant.

2. Were there differences in language used by the teachers in the public on-line conferences versus the weekly journals? "Language" refers to the specific words which the teachers used as they discussed their participation in Carver III.

3. What were the reflective responses of these teachers when questioned about their involvement with computer mediated communication?

### Significance

Computer mediated communication (CMC) is a unique form of communication. It affords a virtually instantaneous mode for providing multiple participants the opportunity to share the complexities and cultures of our world across nearly unlimited distances (Schrum, 1992).

On-line services may be divided into the categories of commercial and institutional services. Commercial ventures, such as America Online and Compuserve, require the user to subscribe to the service for a fee. They operate over a Wide

Area Network (WAN) and are typically more "user-friendly" than institutionally sponsored WAN services such as BITNET (Pierce, 1992). In Iowa, institutional wide area networks are typically not available to public school teachers.

As unique forms of communication, commercial on-line services may have a dramatic impact on how teachers at remote sites interact with each other in staff development activities. This study represents one of the initial efforts to investigate communication patterns among teachers utilizing a commercial on-line service in Iowa.

#### Assumptions

The participants in the Carver III project were volunteers drawn from a group of teachers involved in previous projects sponsored by the Carver Trust. They are from 13 locations within Iowa. Eleven of the teachers are classified as elementary teachers and 12 are classified as middle school teachers. It is assumed that the teachers in this project are fairly representative of all Iowa elementary and middle school teachers. The researcher also must assume that each participant's own perceptions of the reality of computer mediated communication are reflected in the computer mediated communication interactions and interviews.

#### Limitations

All of the subjects involved in this study are volunteers and were required to possess some computer experience as a condition of participation. It is possible

experience as a condition of participation. It is possible that this prior experience may have affected the outcome of the study. A further limitation has to do with the ten months period which has elapsed since the withdrawal or termination of the non-continuing teachers. This delay may have impacted responses to the interview questions.

#### Delimitations

The following delimiting factors apply to this study:

1. Only elementary and middle school teachers in Iowa were included.
2. Only one on-line service, America Online, was utilized for the study.
3. Only the first year of the two-year project was considered.

#### Definition of Terms

Asynchronous communication--the ability of people to take part in conversations at different times (Levinson, 1989, p. 40).

Bulletin Board--the use of a computer-based message system to post, file, and retrieve messages from an individual to a group, where the group is defined by the topic of all the messages (Vallee, 1984, p. 8).

Computer Conferencing--the use of a computer-based message system to define groups of people sharing access to a common topic file through which both public and private messages are exchanged (Vallee, 1984, p. 8).

Computer Mail (E-mail)--the use of a computer-based message system to compose, edit, send, and file person-to-person messages (Vallee, 1984, p. 8).

Computer Mediated Communication (CMC)--communication across distances using personal computers, modems, phone lines, and computer networks (Schrum, 1992, p.4).

Local Area Network (LAN)--a network system among computers in a relatively small area (Waggoner, 1992, p. 234).

Networks--the linking together of computers so that they can communicate with each other (Waggoner, 1992, p. 234).

Synchronous communication--simultaneous exchange of messages (Vallee, 1984, p. 9).

Wide Area Network (WAN)--a communication system that covers a large area, perhaps hundreds or thousands of miles, using lines provided by a telephone company or other such common carrier (Waggoner, 1992, p. 234).

## CHAPTER II

## REVIEW OF LITERATURE

Communication Processes

Communication takes many forms. Plato believed that the communication process merely imitated the thought process. Speech represents the first level of imitation, and in Plato's time speech undoubtedly meant a face-to-face encounter. As we move to contemporary times we find that perceptions of the communication process have not changed a great deal. Feenberg (1989) stated that "communication seems most complete and successful where the person is physically present 'in' the message" (p. 22). Physical presence should ensure authenticity of the communication; one may look ones "interlocutor in the eye and search for tacit signs of truthfulness or falsehood, where context and tone permit a subtler interpretation of the spoken word" (Feenberg, 1989, p. 22). That being the case we might well ask if telephone or radio communication fit into Plato's scheme. Yet few would dispute that such interaction is a highly viable form of communication; the technology of the telephone has had a tremendous social and organizational impact on society (Sproull & Kiesler, 1991).

Written communication, as an imitation of speech, is an imitation of an imitation. If we assume the original to be superior to the copy, then textual communication is low indeed in Plato's hierarchy of being. Yet, again, few would

debate the efficacy of written communication in today's society. "That we still share Plato's thinking about writing can be shown in how differently we respond to face-to-face, written, typed and printed forms of communication. These form a continuum, ranging from the most personal to the most public" (Feenberg, 1989, p. 22).

Into this melee we now insert Computer Mediated Communication, which is neither conversational nor written, but is, as Kochen (1978) describes it, "a new linguistic entity with its own vocabulary, syntax, and pragmatics" (p. 22). This position was supported by Reder and Schwab (1989) when they stated: "computer mediated communication does not have a uniform set of interactive or functional characteristics" and that "these messages will assume a variety of socio-functional niches within the overall communicative economy of the setting, not just one niche" (p. 192).

Kiesler, Siegel, and McGuire (1984) address various ways in which computer-mediated communication differs from other forms of communication. They state:

Computer-mediated communication differs in many ways, both technically and culturally, from more traditional communication technologies. Technically, it has the speed (including simultaneity, if desired) and energy efficiency, but not the aural or visual feedback of telephoning and face-to-face communication. Culturally, computer-mediated communication is still undeveloped. No strong etiquette as yet applies to how electronic communication should be used. (p.1125)



People engaging in face-to-face discourse utilize forms of behavior referred to as "phatic" functions. Phrases such as "Hi, how are you?" to open a conversation; "right" or "OK," to continue the dialog; and "See you later." at the conclusion are rituals used to keep the communication open and to make sure messages are getting through. Facial expressions and body language are other phatic signs used to reassure correspondents that they are still in touch. CMC bypasses the face-to-face reality of such phatic signs (Feenberg, 1989).

As shown in Figure 1, computer users have developed ways of simulating phatic signs. The patterns are created using the colon (:), semicolon (;), hyphen (-), opening and closing parentheses (()), vertical bar (!), right brace (}), opening and closing brackets ([]) and other standard keyboard characters. There have been hundreds of patterns created; for a more complete sampling, see Sanderson (1993).

Chesebro and Bonsall (1989) state: "Beyond eliminating facial expressions and other aspects of physical appearance, computer connections also eliminate the personality clues people can derive from epistolary communications—handwriting, choice of stationery, and so forth" (p. 117).

Similar findings by Bull, Harris, and Drucker (1992) reflect the nature of the electronic culture:

Within the conferencing arena, there are . . . ways in which the sense of environment can be engendered. Conscious efforts toward this end are necessary, since

electronic communications are decidedly non-physical, and can therefore appear to participants at first to be less 'real' than face-to-face exchanges. (p. 43)

: -)	Happy face; smile
: -}	Fiendish grin
; -)	Wink
; -}	Fiendish wink
: -(	Sad face; frown
-(	Late night
: -	Blank stare
: -O	Surprise

Figure 1. Facial expressions used in CMC.

Computer mediated communication, by combining human communication paradigms with machine delivery systems, creates a new type of social arena where the personal and impersonal merge. Williams and Rice (1983) noted that "The new technologies are not, in an overall sense, inherently impersonal or personal. Our main challenge is to understand better their distinguishing qualities and, even more so, to develop our stylistic and persuasive strategies for their most effective use" (p. 204).

Sproull and Keisler (1991) compared the effects of telephone technology to the effects of computer-based technology:

The telephone had extensive and unanticipated effects in part because it routinely extended attention, social contacts, and interdependencies beyond patterns determined by physical proximity. Reducing the constraints of physical proximity increased people's choice of interactions. What you know depends on whom you know, and who you know depends on whom you meet. Our research demonstrates that, as the telephone did, new computer-based communication technology in some organizations is changing attention, social contact patterns, and interdependencies. (p. 7)

#### Developmental Stages

Just as telephone users suffered through multiple stages of development, so too must users of computer mediated communication progress through various stages. Tovey et al. (1990) described 5 stages of development which telecommunication users experienced with some consistency (see Figure 2).

#### Decision to use Computer Communications

"Network" as a noun is defined in The World Book Dictionary (1992) as "a group of people who work together informally to promote common goals." As a verb it means "to meet informally with groups of people who share interests or causes." "Electronic methods do not change the basic character of networking, but rather alter the methods, and radically alter the speed, efficiency, timeliness, and scope" (Tovey et al., 1990, p. 116). At the base of a successful electronic network one will find the individual users, who have persisted through the initial difficulties encountered with computers, modems, software and hardware.

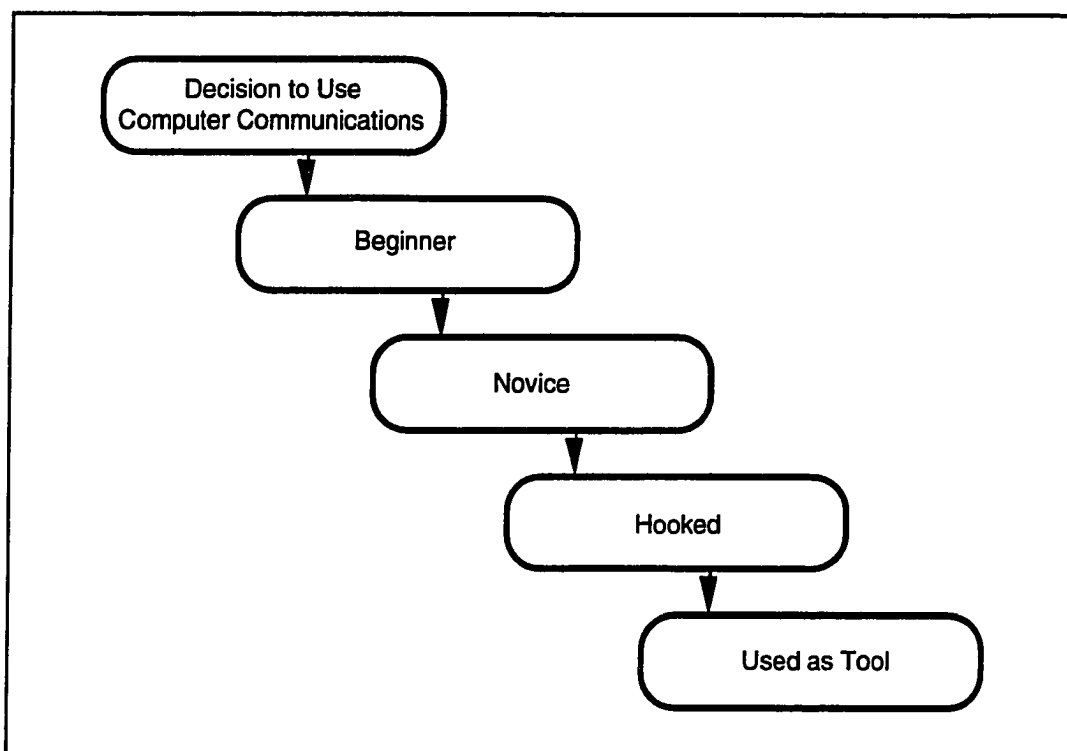


Figure 2. Developmental stages of CMC users.

Note. Modeled after Individual Developmental Stages for Telecommunications Users in "Electronic Networking in Human Service Agencies: A Developmental Analysis" by R. Tovey, V. Savicki, and C. White, (1990), Child Welfare, 66 (2), p. 118.

Before a potential user of computer mediated communications will even consider becoming a "networker," he or she must anticipate that there will be personal gains forthcoming. The decision largely may depend on whether or not it will "be worth the cost in money and start-up time" (Tovey et al., 1990, p. 116).

### Beginner

A beginner in computer mediated communication is a user in name only, requiring persistence and, hopefully, a patient

consultant. Tovey et al. (1990) list nine potential sources of error which may intrude between the sender and receiver of computer mediated communication:

(1) the sender's computer; (2) the sender's telecommunication software; (3) the sender's modem; (4) the sender's phone access; (5) the information system mainframe computer; (6) the receiver's phone access; (7) the receiver's modem; (8) the receiver's telecommunication software; and (9) the receiver's computer. (p. 119)

Any of the above components of the electronic network may prove to be an insurmountable obstacle to the beginner. Great care should be taken to assure that all of these potential problems are overcome.

#### Novice

Novice users have learned to deal with the problematic areas listed above, and are able to send and receive CMC reliably. Their concerns now involve such areas as clarity of their communications, spelling, grammar, appropriateness of messages, and how to overcome the lack of nonverbal clues mentioned earlier. Novice users often engage in sending what many experienced users consider as "junk mail," messages which tend to be trivial in nature, sent simply because the user is now able to send them. This is usually an exciting time for the user as she/he becomes more and more proficient with the medium.

### Hooked

Hooked users exhibit proficient use characteristics; message content becomes more "important" as the mechanics of use become more "transparent." Tovey et al. (1990) describe indicators of hooked users:

(a) users check for e-mail more often than they check for regular mail delivered via the postal service; (b) users feel deprived and isolated during out-of-town trips or on vacations when e-mail access is unavailable; (c) users try other BBSs besides the one used by the rest of the network; (d) users electronically pass along messages received from one network member or from an outside electronic source to another network member without making a paper copy; and (e) users complain about the unavailability of important contact people on the network, forcing them to use nonelectronic means to keep contact. (p. 120)

### Used as Tool

This final stage of operative development occurs as the user begins to incorporate computer mediated communication into everyday activities. These are the users who exhibit disgust at the "junk mail" mentioned previously. The earlier struggles with the hardware and software are replaced by a fundamental reliance on computer mediated communication, similar to most people's reliance on the telephone.

### Communication Efficiency

As pertains to efficiency of communication, computer mediated communication is far less wordy than other media. Voice-only exchanges, for example, use eight times more sentences and five times more words than CMC. Sentence fragments, abbreviations and computer slang are communication

techniques used to reduce wordiness. Similarly, CMC "meetings" are 30 to 35% shorter than face-to-face meetings (Chesebro & Bosnall, 1989). "Accordingly, people report that teleconferencing is more concise, direct, and businesslike; face-to-face meetings are viewed as more personal, relaxed, and spontaneous" (Chesebro & Bosnall, p. 123).

Kiesler et al. (1984) evaluated three measures bearing on efficiency: time to decision, number of remarks exchanged, and percentage of discussion remarks about the group choice rather than about extraneous topics. They found that CMC groups took longer to reach agreement than did face-to-face groups. They hypothesized that this was not due to technical difficulties (keyboarding time), but rather from greater fervor in discussions, perhaps related to the tendency of computer-mediated groups to express themselves more freely than face-to-face groups. Regarding staying on-task, they found no difference between CMC groups and face-to-face groups.

Sproull and Kiesler (1991) demonstrate how three CMC attributes--speed of communication, asynchrony, and group communication occurring as easily as single communication--contribute to efficiency gains over hard-copy communication and telephone communication. Further efficiency gains were reported due to "social effects" inherent with CMC; that is, "by simultaneously linking and buffering people, electronic mail can reduce group coordination costs for conventional

groups, and it can support very large groups of physically separated people that would be otherwise impossible" (p. 35). This would indicate that the most "profound impact of computer-based communication may . . . come from changing patterns of organizational interaction" (p. 35).

#### Consequences of New Technology

Sproull and Kiesler (1991) describe four points to consider regarding potential consequences of new communication technology. First, it is difficult to foresee the full possibilities of a new technology. Thus, the telephone was originally promoted strictly as a business tool--no consideration was given to personal usage and social implications. The first extensive computer network, ARPANet, was begun in 1969 to allow researchers to log onto remote computers and share resources (Roberts & Wessler, 1970). In this context, ARPANet performed as anticipated. Additionally (and unexpectedly), the most extensively used feature of ARPANet was electronic mail (Licklider & Veza, 1978).

Secondly, unanticipated consequences are usually less related to efficiency matters and more related to interpersonal interactions, which may drastically alter how we work and even the work we do. ARPANet's electronic mail enabled large numbers of computer scientists across the country to exchange ideas rapidly and casually on virtually any topic. The unanticipated result was the formation of a large electronic community of friends who had never met face-



to-face (Sproull & Kiesler, 1991). Similar electronic communities are now developing in organizations which make extensive use of computer mediated communications. Teachers, who would be considered late adopters (Rogers, 1983) of the technology, are also beginning to develop such communities, as described by Hawkins (1994): "Inexpensive and readily available technologies offer enormous promise for changing the professional development culture in this country. Telecommunications can provide a cost-effective forum for teachers from around the country to discuss their teaching strategies" (p. 10).

Third, second-level (unanticipated) effects often emerge slowly during the adoption of a new technology. The telephone in 1886 catered almost exclusively to businesses. Not until the late 1920s was it marketed as a social tool (Sproull & Kiesler, 1991). ARPANet's social aspects did not require as much time to develop, but it was many years before electronic mail emerged as the predominate use (Sproull & Kiesler).

Last, second-level effects are not the result of a technology impacting independently on a passive organization, but rather develop as the technology interacts with the social and policy environment. Within the field of computer mediated communication, the declining costs of both computers and long-distance connections were primarily responsible for both the technological breakthroughs and the behavior changes

which allowed computing and communication to develop in new ways (Sproull & Kiesler, 1991).

#### Implementing New Communication Technology

Little research has been carried out regarding the nature of educational activities conducted entirely online.

Schrum (1992) addressed this research vacuum when she stated:

We are only beginning to find ways to facilitate integration of new technologies into the classroom for the improvement of teaching and learning. We have frequently not put into practice what we know about good education and innovation when attempting to bring about change. Use of technology in teacher education and professional development activities may provide the time necessary for educators to gain confidence, identify appropriate uses, and experiment with specific techniques for their own classrooms. (p. 17)

In one of the few references found which dealt specifically with teachers communicating by computer, Winsor (1993) stated:

Little has been said about the benefits [of telecomputing] to teachers. Yet teachers in increasing numbers are joining electronic communities. Those who have taken the plunge have gained access to a virtual world rich in both information and opportunities for professional interaction.

One of the participants in an electronic discussion raised the question, "Why did we decide to learn how to do this (use a modem to communicate with others) when other professionals have not?" Responses included the following: "I have exposure to many persons whom I would (will) seldom have the opportunity to meet in person. "I now have a forum to which I refer when I need some input, feedback, 'water testing' of my ideas. "It is a 'safe place' to openly discuss and debate. "Freedom from prejudice."

In the text-only electronic world, stereotypes such as sexism, ageism, smellism etc., are absent, and one's ideas and opinions stand or fall on their own merits. The validation that educators feel when their ideas are really heard is a benefit of membership in an online community.

For those in the avante garde who don't want to wait for the rest of the world to catch up, belonging to a telecommun-ity (sic) offers the opportunity for do-it-ourselves training, planning, problem solving and evaluation in virtually any aspect of the profession. (pp. 16-17)

Riel of AT&T Learning Network (quoted in Winsor, 1993) stated "I believe strongly that telecommunication is changing schooling and can continue to do so if used in productive ways. Teachers are talking and in their talk they are changing schools" (p. 18). Hopefully "teachers talking" will not exhibit what Rogers (1983) described: "The special thing about educational innovations [is] the extraordinarily long mean-time-to-adoption (MTTA). In many industries MTTA is 3-7 years; in agriculture it is around 5.5 years; but in education, it was 25-30 years" (p. 238).

Hawkins (1994) felt that "the challenge for adopting innovation is discovering how to help teachers incorporate new materials and ideas into their practices as they practice. This takes reflection, revision, and it takes time--something that's in short supply in most schools" (p. 10).

#### Summary

Computer mediated communication (CMC) is becoming an integral part of the communication process. Computer users typically progress through various stages as they adopt this new communication process. Computer mediated communication has been demonstrated to be more efficient than other forms of communication in terms of utilization of human and

material resources. Consequences of using CMC include not foreseeing the possibilities of the technology, slow adoption of the technology, interpersonal involvement, and the impact of the technology on the social and political environments. What little research has been done regarding the implementation of computer mediated communication into the educational arena suggests that teachers are beginning to change the way they interact with each other concerning teaching and learning, but that they need more time and assistance in incorporating CMC into their professional lives. The dearth of research addressing the educational applications of computer mediated communication necessitates further inquiry.

## CHAPTER III

## METHODOLOGY

Procedure

This was a descriptive single case study, the purpose of which was to examine interactions among a group of teachers in Iowa involved in a computer mediated communications project referred to as Carver III in order to better understand those elements which may impact sustained usage of computer mediated communication. The unit of analysis (Yin, 1990) was the group of teachers involved in Carver III.

Yin (1990) described three principles of data collection to be followed in dealing with the problems of validity and reliability: (a) Using multiple sources of evidence; (b) Creating a case study data base; and (c) Maintaining a chain of evidence.

Data Collection

Multiple sources of evidence. Multiple sources of data were utilized in order to address the aspect of validity.

These sources include:

1. Documentation of the eight page Carver III project proposal "Using On-line Services to Enrich Staff Development for Iowa Teachers" (see Appendix A).
2. Archival records constructed on America Online as participants engaged in the required weekly public on-line journals and the three public on-line conferences, downloaded to computer disks.

### 3. Interviews with the participants.

Pilot interviews were conducted with two of the participants who work in the same building. While the two subjects selected for the pilot interviews were included in the final interview process, the nine or ten month interval between the pilot and actual interviews eliminated any recall bias.

The questions for the pilot interviews were constructed in consultation with one of the project faculty. The pilot interviews were done utilizing America Online's "chat" feature in order to determine if America Online would be a viable vehicle for conducting interviews. The format of America Online limits text input in a synchronous mode to two lines of approximately 66 characters each. The interviewer attempted to input questions in such a manner so as to fit within this parameter, however, there were some questions which exceeded the 132 character limit and therefore had to be entered in two separate postings with a 15-30 second delay between postings. Responses from interviewees also were subjected to the same hindrance. This limitation sometimes made it difficult to determine when a person had completed their posting. The America Online program creates a log of such "chats" (see Appendix B).

As a result of the pilot interviews, it was decided to conduct the interviews in person, as oral interviews rather than a written format will eliminate any bias, as described by Kerlinger (1986). The pilot interviews afforded the

opportunity to examine the proposed questions and responses in order to determine if the respondents demonstrated clear understanding of what the researcher was asking.

To establish further an appropriate interview format, conference and journal logs were read to determine areas of concern and interest of the teachers. From this analysis the following areas were added to the interview instrument: (a) technical aspects, and (b) writing background

As a result of the preceding analyses, the final question format was revised (see Appendix C). The researcher asked many open-ended questions and responded to the subject's answers with closed-ended questions in order to demonstrate a clear understanding of the response (Kerlinger, 1986). The interviews were tape recorded and guided by a script of question prompts to enhance the interview validity (Best, 1981). The participants were provided the instrument to read and reflect on prior to the actual interview. The interviewed participants also were provided the opportunity to examine the interviews for accuracy after all interviews had been transcribed.

Personal interviews were set up with each of the teachers involved. All of the participants were very cooperative in arranging their schedules to accommodate the researcher and minimize travel. Many of the interviews were held during the teacher's planning time, which in most cases amounted to a half or three-quarter hour time period which

was their only free time that day. A number of interviews were scheduled during the lunch break, in some cases causing the teacher to miss lunch altogether. The remainder of the interviews were done at the close of the school day. In some cases two or three interviews were held consecutively, which meant that some teachers had to remain at school much later than usual that day. In every encounter this researcher found their attitudes and demeanor apparently unaffected by these sacrifices. In all but one case the interviewer was welcomed warmly and enthusiastically, and even in that one case the subject "warmed up" by the midpoint of the interview and the visit progressed positively and productively.

Case study data base. A data base was developed to establish the evidentiary base. This data base consisted of the interview questions and responses and all case study notes, documents and tabular materials created as the study progressed. Additionally, all logs of the weekly on-line journal postings and the three on-line conferences that were downloaded from America On Line were incorporated into the database. With the exception of the project proposal document and the interview questions, the data base was electronic in nature and therefore archived on computer disks.

Chain of evidence. In constructing the case study report, relevant portions of the case study data base were quoted in support of the data synthesis. The case study data



base itself then reveals the total body of evidence which led to the conclusions reached. The project proposal, interviews and archived records of journals and on-line conferences then established a "chain of evidence" (Yin, 1990, p. 96) linking the study's conclusions to the case study database and establishing validity and reliability. Only materials from the first year of this two-year Carver III project were included in this study.

### Subjects

#### Setting

The Roy J. Carver Charitable Trust is Iowa's largest foundation. The Trust has funded three projects for Iowa teachers--National Geographic Society Kidsnetwork, a telecommunications-based science and geography program; GTV, an interactive classroom tool for teaching American history and geography; and the America Online Telecommunications Project, herein referred to as Carver III, designed to ". . . enable Iowa teachers to learn how to use telecommunications to create an information-exchange network that will enrich both teaching and learning" (National Geographic Society, September, 1992, p. 1). Participants in Carver III were selected from those teachers who had participated in one or the other of the first two projects.

#### Project

The America Online Telecommunications Project, which began in the fall of 1992, was intended to "enable educators

throughout the state to create and exchange lesson plans, disseminate software stacks, and share tips about teaching methods and materials" (National Geographic Society, March, 1992, p. 1).

As stated by the National Geographic Society (March, 1992) in their proposal to the Carver Trust, the goals of the project were to:

1. increase teacher's skills in using technology for educational purposes;
2. enhance teachers' professionalism by linking them to a broader universe of educators and resource materials;
3. provide greater flexibility in the way in which staff development takes place;
4. produce and disseminate instructional materials, such as lesson plans, software stacks, and teaching tips;
5. encourage greater interaction among teachers of various disciplines; and
6. reinforce training programs currently supported by the National Geographic Society and the Carver Trust.  
(p. 1-2)

#### Participants

Because qualitative inquiry involves the researcher as the instrument, it is important to note that he taught a total of 19 years in five public schools districts in Iowa. In two of these districts he served as president of the local education association and chair of the collective bargaining committee. In these positions his duties involved interactions with teachers of all grade levels, allowing him to develop insights into many aspects of human relations

specifically reflecting teacher behavior. In addition, he served as Principal (grades K-12) of one school. For the last seven years he has been involved in numerous aspects of technology application in education. His current position involves training of K-12 teachers through the Iowa Educational Technology Training Institute. This training encompasses many facets of computer mediated communication, including electronic mail and conferencing, and utilization of the World Wide Web.

The National Geographic Society proposal to the Carver Trust outlined a procedure whereby 20 teachers across Iowa would be selected from the original two groups which had comprised the National Geographic Kidsnetwork project and the GTV project. Twenty-three of these teachers ultimately applied for the telecommunications project and all were accepted. The participants (all names have been changed to assure anonymity) included:

1. Dawn Baccam, a fifth grade science teacher from Lincoln Elementary School in Fort Dodge who had participated in Kidsnetwork.
2. Mindy Baird, a sixth grade teacher from West Middle School in Fort Dodge who was in the GTV project.
3. Keith Blasberg, a seventh and eighth grade social studies teacher from Central Middle School in Fort Dodge and a GTV participant.

4. James Casker, a sixth and seventh grade social studies teacher from the Sheffield-Chapin Middle School in Sheffield and a GTV member.

5. Jane Douglas, a fifth grade teacher from Lake Mills Elementary School in Lake Mills and a Kidsnetwork participant.

6. Georgine Getty, a sixth grade Language, math and social studies teacher from the North Central Community Schools in Manly and also a Kidsnetwork member.

7. Helen Halvorson, a fifth grade teacher from Lake Mills Elementary School in Lake Mills and a Kidsnetwork participant.

8. Daniel Happe, an eighth grade social studies teacher from Central Middle School in Fort Dodge and a GTV participant.

9. Christine Humes, a fourth grade teacher from Washington Elementary School in Fort Dodge and a Kidsnetwork member.

10. Terri Jones, a sixth grade language arts and social studies teacher from West Middle School in Fort Dodge and a GTV member.

11. Ted Jurgenson, a seventh and eighth grade social studies teacher from the Storm Lake Community Schools in Storm Lake and a GTV participant.

12. Steven Karsten, a seventh and eighth grade teacher from the Monroe Community School District in Monroe and a GTV member.

13. Wayne Lidtke, a seventh and eighth grade social studies teacher from Sioux City Middle School in Sioux City and a GTV participant.

14. Sharon McAlerney, the Talented and Gifted (TAG) coordinator from Ankeny Elementary in Ankeny and a Kidsnetwork member.

15. Roger Miller, a seventh and eighth grade social studies teacher from the Sheffield-Chapin-Marcus Middle School in Sheffield and a GTV member.

16. Lori Netty, a sixth grade social studies teacher from Meredith Middle School in Waterloo and a GTV participant.

17. Ericka Patton, a fourth grade science teacher from Lincoln Elementary School in Fort Dodge and a Kidsnetwork participant.

18. Patrick Rohan, an eighth and ninth grade American history teacher from J. F. Kennedy Jr. High School in Dubuque and a GTV participant.

19. Tracey Roling, a sixth grade elementary teacher from East Hardin Community School in Alden and a Kidsnetwork member.

20. Jodi Siegler, a fourth grade science, math and language arts teacher from the Eldora Community School in Eldora and a Kidsnetwork member.

21. Marcia Sisk, a fifth grade math, science and language arts teacher from Washington Elementary School in Fort Dodge and a Kidsnetwork participant.

22. Kathleen Sunnes, a teacher of gifted students in grades three through eight in the Charles City Community School, Charles City, and a GTV member.

23. Angela Toomsen, a fifth grade teacher in the Ankeny Elementary School in Ankeny and a Kidsnetwork participant.

Of the 23 teachers accepted for the Carver III project, 22 were available for interview after the completion of the first year of the project. The other teacher had moved from the state and was not included in this study.

Fourteen of the 22 teachers were female. Nineteen of the 22 were married.

The researcher believes that the willingness (in most cases, eagerness) of the 22 teachers involved to be interviewed for this study demonstrates a quality typical of Iowa teachers: their ability to adapt to new situations and innovations in education. After meeting and visiting with each of these people, the researcher's perception, based on more than 25 years of working with Iowa teachers, is that there is nothing particularly unique about any of them--they were all typical Iowa teachers, dedicated to their students,

their school, and their profession. All were willing to undertake the risks involved in incorporating a new and innovative teaching methodology, work with it for a year, and then discuss their feelings and perceptions frankly and openly. There was no hint detected of anything but an honest and straightforward description of their experience with computer mediated communication.

In addition to the 22 teachers involved there were project faculty providing guidance and training throughout. Faculty members included a representative from the National Geographic Society, an Iowa director for the project, and four lead teachers. While input from the project faculty can be seen throughout the online conference portions of the data and is important to the context of the conference discussions, no faculty input was included in determining categories in this study, as their input was not germane to the focus of the study.

Those teachers selected for the project exhibited both an interest in and competence with educational technologies; were required to have access to a computer (either Macintosh or Apple II series), telephone line, and modem; and agreed to attend a one-day training workshop and a follow-up workshop. The teachers were provided free access to America Online and were reimbursed for long distance telephone charges if a local connection was not available. Each project participant

was required to attend two on-line conferences each semester, and submit a weekly on-line journal.

### Analysis

Multiple sources of data were utilized in this study. These sources include:

1. Documentation of the eight page Carver III project proposal "Using On-line Services to Enrich Staff Development for Iowa Teachers" (see Appendix A).
2. Archival records constructed on America Online as participants engaged in the required weekly on-line journals and the scheduled on-line conferences, downloaded to computer disks.
3. Interviews with the participants.

The data were analyzed using a methodology described by Glaser and Strauss (1967) as constant-comparative. Using this method, each incident (for example, an interview question and its answer) was coded into "as many categories of analysis as possible as categories emerge or as data emerge that fit an existing category" (Glaser & Strauss, p. 105). The categories were determined by the language which the participating teachers used in their responses.

In the constant-comparative method, while coding an incident for a particular category it was compared to previous incidents coded into the same category. With this procedure, all incidents were compared to all other similar incidents, with the result that the comparisons begin to be



with properties rather than incidents. It was then possible to delimit the categories, resulting in a manageable number of categories with which to code the remaining interviews.

Glaser and Strauss (1967) described this constant-comparative process:

Using the constant comparative method makes probable the achievement of a complex theory that corresponds closely to the data, since the constant comparisons force the analyst to consider much diversity in the data. By diversity we mean that each incident is compared with other incidents, or with properties of a category, in terms of as many similarities and differences as possible. (pp. 113-114)

Since this is an inductive method, the categories could not be specified in advance of the analysis, but emerged from the analysis of the data. What the researcher ended up with is an explanation of the behaviors encountered in the research.

While the constant comparative method is a valuable tool for analysis of raw data, Glaser and Strauss (1967) asserted that:

The constant comparative method is not designed . . . to guarantee that two analysts working independently with the same data will achieve the same results; it is designed to allow, with discipline, for some of the vagueness and flexibility that aid the creative generation of theory. (p. 103)

The timeline for this process was as follows:

1. Journal and conference data exist as logged data from the online provider.

2. Pilot interviews were conducted to test the online service for suitability and to determine appropriateness of the initial question prompts.

3. The journals and conferences were examined for topics and categories to be included in the interviews.

4. The interview instrument was revised.

5. Interviews were scheduled and the interview instrument sent to each participant prior to the actual interview.

6. The interviews were conducted and transcribed. Participants were provided copies of the interview to check for accuracy.

7. The data were analyzed.

8. The case study report was written.

The codes and categories were determined by the researcher's analysis of the teacher's language, guided by the initial research themes:

1. What topics did the participants discuss while using computer mediated communication?

2. Were there differences in language used by the teachers in the public on-line conferences versus the weekly journals.

3. What were the reflective responses of these teachers when questioned about their involvement with computer mediated communication?

The synthesis of the data was researcher-directed. The mechanical aspect of the coding and sorting process was accomplished through the use of Hyperqual Version 4.3 (Padilla, 1992), a computer program designed to "assist in the recording, management, and analysis of data, particularly text data, in the tradition of qualitative data analysis" (Padilla, 1991, p. 8). Hyperqual allowed the analyst "to enter data, tag ("code") selected chunks, to sort data chunks, and to output text as needed for inclusion in narratives and reports" (Padilla, 1991, p. 10). Hyperqual was utilized for analysis of the interviews, journal logs and conference logs.

CHAPTER IV  
SYNTHESIS OF DATA

Introduction

In order to ascertain elements which impact sustained usage of computer mediated communication by these teachers, data obtained from journal and conference logs and reflective responses obtained during personal interviews were analyzed to determine pervasive themes. Within the context of the literature review and consistent with the research questions, themes and related thematic topics were identified. These were presented, examined, and illustrated in this chapter.

For purposes of this study, sustained usage refers to whether or not the teachers attained the level of "hooked" users as described by Tovey et al. (1990). Those who reached this level were characterized by the researcher as "more successful" and those who did not were deemed to be "less successful."

In illustrating the categories in this chapter, all data are from the first year of the two year Carver III project. In discussing the various categories herein presented, quotations which the researcher deemed representative of the overall nature of the category were presented. These quotations were taken directly from the computer mediated communication postings and transcribed interviews. No attempt was made to correct or delineate errors in spelling, punctuation, grammar, etc., as a pervasive trait of computer

mediated communication is that little effort is made to correct such "typos." This idiosyncrasy of electronic communication is found particularly with email, but also extends to other forms of CMC as well. Ray (cited in "E-mail," 1996) stated "People wouldn't send out sloppily written letters through the regular mail system, yet people today don't think it is important to practice the same rules with e-mail" (p. B5). None of the teachers in this study reported any discomfort with this aspect of computer mediated communication.

#### Developmental Stages

As described in Chapter II, Tovey et al. (1990) described 5 stages of development which telecommunication users experience with some consistency. Not all of the subjects in the present study attained the same stages of development.

#### Decision to use Computer Communications

In volunteering to participate in Carver III, each participant displayed a willingness to "take a risk," to experiment with something unfamiliar to them. The degree of commitment varied considerably among the teachers, however.

The researcher has categorized this degree of commitment into three divisions: excited, somewhat excited, and unexcited. Those who were excited described their use of CMC using strong affective language (e.g. love, thrilling, exciting) action words (e.g. caught) and words that expressed

intensity in a positive manner (e.g. very thrilling, really neat).

I love to be at the front, if you walked in here with a project from somebody tomorrow and asked me if I would do it and if it intrigued me I would do it because I like to expand kids, expand myself . . . it caught my interest and it caught it in a way that I could include my classroom and that's all I'm concerned about is improving my classroom for my kids. To wide, knowledgeable individuals.

It was so exciting to me to think that we were doing something new, we were exposing these kids to something that not a lot of kids had experience with. I found that very thrilling, very exciting, really neat to do.

Those who were somewhat excited used less enthusiastic language in describing their use of CMC, language that involved intensity words (such as very and really) in a combination of both positive and negative comments. In addition they used affective language to a lesser degree than the excited group (e.g. like, willing) in describing their involvement:

I still would certainly regard it even now as a very cutting edge kind of thing, and perhaps with my very limited experience I really don't, I don't really realize what the potential is, how it can really be used, but again, you're talking about a lot of time to sit down in front of that and go through those various folders and read and so on and so forth. It is very time consuming. It is.

There is a little bit of excitement to think you're a pioneer, explorer, adventurer, and it was also a way, I wanted to learn more about it.

I did like the idea of having a new angle, a new possibility. You teach for 15 years and say well, there's probably other ways to go about some of the things. I've always thought that change was good and good motivation. And it has been, so I went into it

with my eyes open and willing to see what it was and it worked out real well.

Those who were unexcited displayed very little enthusiasm, using negative descriptors (such as don't, didn't) with an overriding tone emphasizing a lack of use of CMC.

I don't think I've really tapped, I don't think I've really known what could be done with . . . I just really didn't feel the motivation.

I think it could have been more than what I allowed it to . . . I know there was so much more I could have used.

I don't think it was anything earthshattering for my teaching because I didn't use it enough to make a huge difference.

### Beginner

Beginners in computer mediated communication have only committed to attempt using the technology. There are many possible perils to be overcome before they progress. Tovey et al. (1990) list nine potential sources of error which may intrude between the sender and receiver of computer mediated communication:

(1) the sender's computer; (2) the sender's telecommunication software; (3) the sender's modem; (4) the sender's phone access; (5) the information system mainframe computer; (6) the receiver's phone access; (7) the receiver's modem; (8) the receiver's telecommunication software; and (9) the receiver's computer. (p. 119)

As beginners, most of the participants in Carver III reported problems with one or more of these nine areas. The problems which were most often encountered included (2), the

sender's telecommunication software; (3), the sender's modem; (4), the sender's phone access; and a combination of (8) and (9), reflecting problems with America OnLine (AOL).

One problem, it was just stupidity on my part, when I tried to load AOL I just screwed it all up! You know, I called for help, got some more specific instruction.

We did have some problems with modems, but it was our modem and I don't know what happened, it just didn't work for us, we had to buy a new modem.

Major at the beginning. This building is about 75 years old, and just getting a phone line to a classroom was a trick. My computer literally turns everything off in the office when I turn my modem on, and also because of the way the building is built, I went through two different harddrives because of power surges.

We had to get a dedicated line because we kept getting bumped off.

Sometimes, there are certain days when AOL is not real workable, they're doing some cleaning up or something.

One teacher reported problems with just about everything described above:

I have had about everything you can imagine going wrong with these computers go wrong and the Carver III people have been fantastic in assisting me.

And another teacher, while reporting numerous problems, at least maintained a sense of humor:

I think most of the technical problems were self-inflicted!

### Novice

As beginning users the Carver III participants learned to deal with the above problems. All then progressed to the novice stage, where their concerns became more with how his or her communications appear to others as they experimented.



My memory isn't what it should be for all the little twerps and twigs you know for smiles and grins and so forth, and often times your tone of voice would inflict what you wanted to say, and you can't get that on the computer. It doesn't uh . . . its a quick way to get a message to somebody!

I think one of the hang-ups at first was spelling but once you get through it its like that's not important, you're not going to worry about that, the important thing is getting the ideas

I hit a lot of wrong keys and I was always thinking about it constantly, cause I didn't use it, use it enough, type enough to really feel comfortable. I didn't like that part of it.

### Hooked

Hooked users have reached the level which this researcher has described as sustained usage. Some of the characteristics exhibited by hooked users include checking frequently for email messages, forwarding messages to others, experimenting with other on-line services, and commenting about being forced to revert to non-electronic communication. Eleven (3 male and 8 female) of the 22 teachers described or exhibited behavior which would qualify them as hooked users.

Last week I was absent and didn't get a chance to check my mail for a few days. I was amazed to see how many messages were waiting in my mailbox.

Sometimes it'd be just 15 minutes when we'd pick up mail, then we'd go off-line and write our mail before we'd send it.

I just go on and pick up my mail and send any mail I need to send and then I'm off again.

I spend probably 15 minutes a day, personal use.

I do not have the capability to send pictures (I can only dream about things like that!), but I will gladly

send you some via the "other" mail service if you would like.

We have Genie at home also. We had Compuserv for a little while. We tried out Prodigy for a little while. We didn't like that as well as AOL.

Like Prodigy and Compuserv, and Infonet I checked with my local telephone company and we could get that for \$30 a month and that's no long distance charge. We could get into internet that way, but we wouldn't have the AOL stuff, I like the AOL scholastic stuff I think they're more school oriented, for the kids.

### Used as Tool

As users entered the final stage of operative development they began to incorporate electronic communication into their everyday activity. The most frequently cited uses of computer mediated communication were email and supplementing regular classroom activities. At this stage there are also references to expanding uses, such as adding internet access.

It was usually the first thing I did in the morning and sometimes the last thing at night.

Yeah, checking mail pulling stuff off the screen that I might use in class . . . we follow the stock market, we do an economics unit and we use AOL for that.

You pretty much have to call in every day to get your mail and so forth.

I usually pick up mail every day. A lot of times I can go a little bit early and pick up my mail in the morning before 8 o'clock, and often after school I'm on a little bit.

See, our building's also getting internet, our principal has internet, it's being put into 4th grade and 5th grade also. I've accessed internet from AOL too. I have Prodigy and I'm trying to sell it, I don't want it. I just got it free when I bought a modem. I haven't heard good things about Prodigy, Compuserve I've heard

about but I'm very happy with AOL. Everything I've read about AOL says its probably the most expensive but it's also probably the best so I'm certainly not going to go with something else.

As the teachers progressed through the various stages of development, a gender issue became apparent. Within the original group of 22 teachers in this study, 36 percent were male, whereas within the group of teachers exhibiting sustained usage, only 20 percent were male. The finding that male subjects in this study were less successful than female teachers contradicts other research findings (Becker, 1994; Kiesler et al. 1984).

#### Research Themes

The three themes of discussion topics, language differences, and reflective responses were identified at the outset to guide the researcher and focus the investigation. The various data fit these themes in differing ways, yet common threads did emerge among the sources.

#### Discussion Topics

In evaluating the journal postings and on-line conferences, typical topics of discussion fell into four categories: (a) social, (b) school related, (c) class related, and (d) personal.

Social. This group of teachers exhibited a large degree of socializing at the beginning of their computer mediated communication sessions. In the vast majority of the journal postings, a period of socializing can be identified in the

posting, just as though the individuals involved were gathering face to face. Often such social discourse is apparent at both the beginning and the end of the posting as the participants discussed personal activities, weather, holidays, family, time, etc.

Should be home and do some yard work--its pretty decent out today. Lost our first game of the year on Friday night . . . My daughter is a Varsity cheerleader-junior. She doesn't have a date and is in a big panic.

Wow! Another week has passed already. How fast time has been going! Next week will be Thanksgiving. I am looking forward to the break . . .

Thanksgiving break is almost over. I can't believe how fast time goes! Did anyone else get caught in that snowstorm on Wednesday? I traveled from school to home (a distance of about three miles) and it seemed to take forever. The two main entrances into town involve driving up a hill. I had to back down twice before I finally made it. Needless to say, I was glad to get home and I stayed put until the roads were clean.

Another week has gone already. I have been taking advantage of our snow days to get caught up on grades and papers but I still have a long way to go before I can send report cards home

Hi everyone!  
My apologies for not writing last week. I can ditto what everyone else has said about the weather. We dismissed at 12:30 Wednesday, but the buses brought the kids back because it was so slick. We were lucky. The last of our students left at about 3:45. Some schools had kids until 6:00pm. In some schools, the teachers had already left when the kids came back. Most of our staff was still here so we had enough supervision. Just one of those things that makes winter in Iowa so exciting!

I have really enjoyed each of your comments about your schools and communities. I am sorry to be a day late with my journal. I have found the last week to be rewarding and confusing.

Greetings to all. Things are going as well as to be expected.

Enjoy your weekend and the beautiful Indian summer weather!

Within the on-line conferences the same period of social interaction occurs as the participants gather for the conference. In addition to the small talk often present when people gather, references to problems and activities which the teachers are experiencing appear.

A drawback of AOL's conferencing format was that each participant was limited to two lines of text approximately 66 characters long. Lengthy entries therefore had to be made in two or more postings, which allowed other postings to intervene. This process often made the conversation strands somewhat difficult to follow. The reader will notice in the illustration which follows that there was often a six to ten line lag between a posting by one teacher and a reply by another.

Input from the project faculty is important to the context of the conferences, and may be seen as entries from Fac1, Fac2, etc. Faculty input is not utilized in identifying categories of inquiry, however. As the conference moderator (Fac2 in this illustration) attempts to take control of the conference, the other participants are instructed to "highlight" Fac2. This is a feature of AOL's conferencing procedure intended to make the leader easier to identify.

For illustrative purposes, only a small amount of the socializing process from the first conference is shown here. The complete transcript of the social portion of all three conferences is available in Appendix D.

Fac2: Lori....  
 Fac2: hello  
 Fac1: He's here. Mind is engaged! What a concept!  
 Fac4: Hi Lori! Glad to see you made it.  
 Fac2: Did everyone get the instructions on hiliting?  
 Lori: GREETINGS!  
 Fac3: welcome Lori  
 Fac2: Ted! Mr. Best Dressed!  
 Fac2: How are you?  
 Fac3: Ted - hello  
 Ted: GOOD TO BE HERE  
 Fac1: Good to see you, everyone.  
 Fac3: the room is fillin up  
 Fac2: Unlock the caps Ted...it means screaming on-line!  
 Fac3: Hi Georgine  
 Fac2: my ears are rining. lol  
 Fac2: ringing...duh!  
 Fac1: I think we will have a full house from all indications.  
 Ted: I don't want to scream, sorry  
 Georgine: Hi, everybody  
 Fac3: Yeah - Kathleen  
 Fac1: Hi, Rick! Did you get the problems solved on the Mac?  
 Fac2: ahh...much better.  
 Fac2: Welcome Kathleen.  
 Fac2: What a room full of talent!  
 Kathleen: HI EVERYBODY!  
 Fac4: Kathleen made it (at home)  
 Fac3: Daniel - Hi!  
 Fac5: Hi all, hope to see you at the parade on Sat  
 Fac2: You guys have been terrific in getting things done.  
 Fac2: your journals, student notes, e-mail...thanks for your hard work.  
 Georgine: It has really been a rush trying to do it all.  
 Kathleen: What's Saturday's parade?  
 Fac2: Helen! Welcome! Is Jane with you?  
 Fac1: My kids have been EXCITED about all the information piling up in their direction!!

Wayne: No! I have to take everything off the MAC to get the printer to do its screen thing! I sent mail!

Fac2: Has everyone been able to follow the directions in hiliting?

Fac4: Good idea

Wayne: I got to miss the UNI homecoming! Got to teach a sex clinic to middle school kids!

Fac2: It will make this conference much easier to follow.

Georgine: Yes, I have you highlighted, Marsha.

Fac2: If you are on a Mac...click on the people button in the upper left corner

Roger: we have you hilited

Fac1: GS people, did you get your note on hilighting? Any problems?

Kathleen: What do you mean---highlighted?

Fac2: then hilite my name in blue...and click hilite on the right side of the screen.

Kathleen: My monitor is in b w

Fac2: This will allow you to see the hosts (moi) typing in bold face.

Georgine: It is so much easier on the Mac.

Fac1: Blue is grey in B&W

Fac2: You should still be able to do it.

Fac2: Try it Kathleen.

Fac2: thanks Bob.

Fac2: Welcome Mindy!

Angela: Fac1 - Did you get my message about the address book for the IIGs?

Fac2: I will begin an open ended sentence. I would like you all to fill in the blanks.

Mindy: Thanks! Terri is also here.

Fac1: GS people, you have to use the Apple-T to get your menu bar, then click "People" on the far right

Fac2: READY?

Daniel: Bob, will you go through the steps to download from the student to student text?

From the above discussion, it is obvious that not only does much socializing occur, but it continues for a considerable amount of time. Part of this process is attributable to late arrivals. In a face-to-face meeting, late arrivals are apt to "sneak in" unobtrusively; in these computer mediated communication meetings, there appears to be

less concern about interrupting--people tend to announce themselves as they enter. The conference log only showed starting and stopping times for the conference as a whole, but based on observations of conferences, this segment occupied approximately 15 minutes of the 57 minute conference.

As the social aspect of this conference continued, it was also obvious that the conference leader, Fac2, was becoming very impatient with the others. Between the time Fac2 first attempted to gain control and the time when said control was finally established, 38 extraneous postings occurred. The difficulty that Fac2 had in establishing control may have been due to the fact that the conversation strands within America On Line's conferencing feature are difficult to follow. Many of the teachers commented on the difficulty of following the conferencing aspect of their computer mediated communication experience. Typical comments included references to the fast pace of the conferences and the physical location of the conversation strands.

The one problem I originally had with conferencing was trying to follow a multitude of conversations that are going on and its, I guess I'm sorta slow, and I'm not a fast typer, so when I'm typing a message in or a thought in on my part of the conversation I'm missing other parts up there and that kinda frustrates me and I try to hurry and then I make even more mistakes so....

Sometimes the pace was kind of hectic, you feel like, you know, very few people type well enough to begin with, you know, you feel like you're trying to push to get an answer...and then you're self conscious about your mistakes too.



I had a terrible time keeping up with everything that was going on and everything's coming from, you know, everybody's throwing their comments in and I find that very confusing. Yeah, I just, it was, yeah, I don't know that I enjoyed that kind of teleconferencing.

Everybody was on board there, putting in what they wanted to say, although it got a little uh, you weren't sure, just watching the lines come up you weren't sure if it would really be there as a response or a few maybe a paragraph down then your question would come and then people would have to figure that out, who was speaking...and that, that's a challenge.

I'm one of those that got frustrated comes time for those conferences, cause you're sitting there trying to type it in, you're reading what everybody else is doing so you don't get the same question up there and or you don't feel like buttin in on somebody else's conversation, you know, you're reading two peoples' conversation going back & forth, well you know, you don't wanta just jump in there and ask a question, so you don't ask a question when you should.

The second on-line conference also involved a great deal of socializing at the beginning. Part of this, however, may have been due to the fact that the conference leader was late arriving at the conference. Even so, the social aspect of this conference exhibited an 8% decrease over the first, 164 lines as compared to 179. The number of participants declined from 18 to 17, a 6% drop.

By the time they conducted the third conference, the number of participants had dropped from 18 to 11, a 39% decline, while the social interaction had dropped 52% to 86 lines, and required only 5 to 10 minutes.

This group of people behaved no differently than any other group meeting on an occasional basis: they exhibited a

need to socialize before "getting down to business." The fact that they were meeting on-line rather than face-to-face did not alter this. The finding that the socializing process decreased over time, from the first conference to the third, correlates with the findings of Williams and Merideth (1996) regarding social activities within on-line communication processes.

Kiesler et al. (1984) investigated the differences between face-to-face communication and computer mediated communication insofar as its effect upon participants, finding that "In traditional forms of communication, head nods, smiles, eye contact, distance, tone of voice, and other nonverbal behavior give speakers and listeners information they can use to regulate, modify, and control exchanges" (p. 1125). When asked if the lack of face-to-face contact bothered them, nearly three-fourths of the participants in the present study replied that it did not. Some likened the computer mediated communication experience to using the telephone.

no, that didn't bother me. Its like being on the telephone, you can't see the person on the telephone

Its kind of like using the telephone in some ways.

While the lack of face-to-face contact did not bother most participants, many did express a preference for personal, visual contact.

not really, lot of times I like it, ah, I want to meet em, I have this undying urge . . .

I don't know if it really bothered me, it is strange not seeing the face . . .

I think there are all sorts of non-verbal clues we get when we're dealing with somebody face to face that we lose out on, but I don't think it bothers me. In some ways it might be better.

No, and it didn't bother my students either. But if I had a choice I would rather see the person.

Some observed that their students also interacted well without the face-to-face experience.

In fact the kids think its really neat! "You can talk to them and you don't have a receiver in your hand"?

One of the students who's been using AOL in my classroom has very poor social skills, does not have a good peer interaction, but over the network nobody can tell that.

That's one of the things that the kids commented on. They were doing exchanges with these people and they didn't know how old they were for sure, they didn't know what color they were and they were just carrying on a conversation with them and they didn't know anything about them. They found they could still be friends with them.

School related. Many people define who they are by where they work. This precept may also be applied to these teachers. A close association with their school was apparent in many of the conversations as the teachers in this study described how their personal lives and their school lives intertwine, not only with computer mediated communication, but in other areas as well, such as the type of magazines they subscribe to and what they read, how much of their own spending is school related, and how much of their own time is spent on school activities. "School related" refers to those

times when the teachers specifically made connections between school and other aspects of their personal life:

I've done a little bit in the personal line, but most of my things have been school related that I've done.

I take lots of teachers magazines. Depends on what I'm into at school.

Because when I consider all the money I spend on school, its a terrific amount.

My personal time is so involved in school and what's going on here that it's hard to separate the two.

Mostly job related. Reading things that are going to help with my teaching or that the kids would be interested in, books for this age group, I try to read those during the summer so I can relate to what the kids are reading now. I like to read romance novels for myself. During the school year its school connected.

I decided I wanted to learn how [to use AOL], so I spent hours after school nights playing with it.

We asked if we could go to the 1st of June or will it be on for 2 weeks after June so that when school was over we could still work with it [AOL].

I would be doing it [email] for school, not for me, I just wouldn't [utilize AOL for personal use].

My husband and I are both teachers, so it seems that our whole life is either church, school or family!

Class related. Much of the conversation in the journals and interviews centered around the teacher's class as opposed to the school community in general. During the introductory workshop the National Geographic Society advisor, Lucy Hagen, whom many of the teachers had met while involved in an earlier Carver Foundation grant, queried the participants as to what they expected to gain from the project. These responses indicate the degree of classroom usage many of

these teachers foresaw as they described interactions between their students and other students across the state and how their students would use email and other aspects of computer communication:

Opportunities to use America On-line with students in my classroom and across the state!

How to better put America-On-Line to use in my classes.

More aspects of the America On-line program and ways to better utilize it in my classroom.

How to use America On-line to better facilitate my students. To learn how to send E-mail and receive mail.

How to use the America On-line to stimulate the students and myself - it's still scary, Lucy!!

I will use my new skills regarding America On-line to expose my students to the world of computer communications.

Working with students, meeting instructional and affective needs, correlates with increases in teacher satisfaction, effort, involvement, and motivation (Blase, 1982). The journals and the interviews illustrate this axiom extensively as these teachers describe how their students benefit from email, conferencing with other students around the state and around the country, demonstrating CMC to their parents, and developing their problem-solving capabilities as they become more and more independent using AOL:

Our kids have receive mail from our Iowa friends in the project and our conferences have been a big hit. We have many new friends around the United States thanks to our E-Mail contacts. I have to stop and get the kids back to work

We did meet with Georgine's class in Explorers Hall on Tuesday evening during our Open House. We had around 20 parents in here at that time. It was exciting. You could hear the disbelief when we first started to talk to each other. Then the questions started. The students were able to answer a lot of the questions which was great! The parent were impressed!! Also thanks to all of you who sent mail. We were also able to show parents about sending and receiving mail. As Bob said, we probably covered 1/100 of the capabilities, but it was exciting to do that much.

My class started the Great E-Mail Race today. They are excited! They cannot wait until they get replies. Then my class writes the letters and sends them. They have already figured out that they can save the basic letter format, and add or delete questions for the individual schools.

We are also planning to participate in the AO election on Nov. 3. Our school is having a mock political convention on Oct. 29, so we have done a lot of work on the election already. Giving the class a chance to vote will be a great way to wrap things up!

My class loves seeing that flag on the mailbox go up when they sign on.

My class would enjoy meeting with yours!

My class is becoming independent in using AOL. They have to ask questions occasionally, but I am really proud of the way they have taken on the responsibility of journals and the Great E-Mail Race. We have learned so much already!

Yesterday, we received a reply from Hawaii. That sent a real murmur of excitement through my class. The person who responded wrote about the devastation from the Hurricane. My class is learning much through this activity. They are getting more and more independent working on the computer each day. It's fun to watch their growth.

The rest of the groups are busy working on something else (which I try to have related to an AOL activity).

My daughter is going to UNI next year, and one of the reasons she likes about education, she's going into elementary ed, is that she saw how kids got turned on from certain projects. She would come with me and see

how conferences worked and that sort of thing, she wants to be a classroom teacher and she wants to be the best she can be. She's proud that she's going to UNI, she chose UNI over other ones because she thinks it offers her what she needs to do these kinds of projects, to help kids learn and to make kids want to learn. I told her that she has to understand that things aren't static, they're going to change and she might not like the way it changes, and she said "I've lived in your house all my life and you've been a teacher all the time I've been growing up, and those 18 years that I've been here I haven't seen you change - you've changed the style of teaching but I haven't seen a difference in the way you teach, you teach for kids" and that made me feel good, she's aware of how I feel about what I do, she wants that.

My students are excited about the chance to share about our community and school.

It motivates the kids, if they're doing something with America On-line they're a lot more motivated to do it than if its not there. The scrapbook project would be an example of that. Sometimes to get the kids to write, its just like pulling teeth, but if they know they're going to write and send it to other schools on-line, then they're real excited about writing and they want to make sure its a perfect polished piece before they send it because they know the other people are going to be reading it

His kids and my kids started writing back and forth to each other, and my kids learned a lot about Indian philosophy. The kids really started to understand that we really did an injustice, you know, and when they start making those correlations and they make those comments themselves, there's no lesson I had up to that time that could have done that. The kids are learning to analyze and think.

As did the teachers in this project, Goldberg (1993) addressed the important aspect of class involvement:

"Teachers are Very Busy People. The likelihood of teachers using an on-line network . . . is going to be minimal if the students in their classes cannot get involved" (p. 76).

Personal. While these teachers put primary emphasis on what AOL did for their students and the school, most also made use of the service for personal needs or satisfaction. Such use ranged from hobby related areas to vacation planning to educational pursuits. Only one unequivocally reported no personal use for the on-line service.

I've done a little bit in the personal line, but most of my things have been school related that I've done. I did find one section particularly intriguing, my husband and I are both involved in family genealogy. They had a section on that, and I was pulled towards that like a magnet. Also, I'm interested in the seniornet because I don't have very many years left in education and I'd like to - thinking about various things I could get going at home, and thinking that in the future that would give me some contacts that I might enjoy too.

I've gone into a couple of areas that interested me personally, for instance the genealogy area, I haven't done a lot in it but I did some checking to see what they had on-line.

Yeah, I used it, I tried to find as many different areas. I went into CNN a few times, as a matter of fact they sent me a T shirt because I was the first person to be on the chat line with them as far as just discussing news items with them. I used it a lot in my, I finished up my masters last year, and I used it a great deal through the modeling, which I was using cooperative learning but I was showing how I could use cooperative learning implemented with different technology, so I used the AOL with that. And that was real helpful that way, so I used it for my own personal benefit as well as the benefit of the kids.

Yes, I even checked out rental cars for a trip to Texas, and airline prices and schedules and I found things for my son's high school class. My daughter for the science fair needed ideas and there was a section that was all science fair projects, it had the hypothesis, the procedures, the materials, they got first place! You know, I just dialed in, and she was looking for something, and here were some ideas, if you want to do



them with your partner OK and if you don't I don't care. And they picked one and they did well with it.

I don't know that I've used AOL as well as I should have in that way. There have been some things that I have done that are totally separate from what I've done with kids, my time on line I tried to spend to benefit kids, but there were times on-line that would be totally for me, you know, like getting into some of the research areas, getting into some of the news areas, going in and looking for files on curriculum and things like that, there's certain things that I did that were just totally for me and maybe in the long run that enhanced the kids, but most of the time I spent working, try to figure out what I could do for kids.

For me personally? No.

#### Language Differences

Journals and on-line conferences involve different styles of writing. Thoughts expressed in a journal are usually deliberated on at length before and/or during the posting process. During an on-line conference, thoughts are usually in response to a specific question or topic, and little advance contemplation is possible. Additionally, during an on-line conference participants are often hurrying to complete their posting before the next topic is broached. As has been previously illustrated, conversation strands within an AOL on-line conference can be difficult to follow. These factors may combine to produce differences in language usage as reflected by readability level.

Twenty of the 22 teachers posted to both journals and on-line conferences. The postings of these 20 participants were analyzed for writing/reading level using the Rix method, a "simplified readability index based on the rate of long

words" (Anderson, 1983, p. 495). The Rix index compares the number of words containing seven or more characters with the number of sentences in a given selection. By using this index the sometimes substantial difference between the length of the journal postings and the conference postings is also accounted for. Journal postings showed a mean index of 2.04, while conference postings reflected a mean index of 1.08. This would suggest that these teachers did indeed write at a higher readability level while conferencing than they did while journaling. Figure 3 illustrates this analysis.

	Journals				Conferences			
	Total Words	Long Words	Sent.	Rix	Total Words	Long Words	Sent.	Rix
1	576	64	34	1.88	no conference postings			
2	258	34	19	1.79	259	32	31	1.03
3	171	17	13	1.31	231	27	28	0.96
4	425	67	47	1.43	90	12	16	0.75
5	144	22	11	2.00	124	21	19	1.11
6	1963	281	151	1.86	657	93	91	1.02
7	1625	245	45	5.44	538	74	72	1.03
8	1596	250	93	2.69	306	37	33	1.12
9	386	57	36	1.58	787	110	110	1.00
10	1171	224	102	2.20	no conference postings			
11	359	69	33	2.09	227	26	21	1.24
12	513	90	42	2.14	327	60	33	1.82
13	238	33	22	1.50	206	37	30	1.23
14	394	66	31	2.13	163	25	22	1.14
15	555	57	55	1.04	51	9	10	0.90
16	1661	237	133	1.78	270	32	36	0.89
17	1035	234	82	2.85	313	43	37	1.16
18	310	45	25	1.80	420	58	49	1.18
19	416	84	45	1.87	244	54	27	2.00
20	1534	209	139	1.50	43	5	8	0.63
21	1220	126	79	1.59	260	35	38	0.92
22	1002	163	72	2.26	513	60	75	0.80

Figure 3. Analysis of journal and conference readability.

Note: While a discussion of inferential statistics is beyond the scope of this dissertation, a brief description of the significance of this table will be found in Appendix E.

### Reflective Responses

Before conducting the interviews with the teachers, each was provided a copy of the interview questions so they could reflect upon them prior to the actual interview. These questions are provided in Appendix C. In analyzing these reflective responses, seven behavioral or attitudinal patterns emerged: (a) home use; (b) frequency of use; (c) sharing of experiences; (d) relevance to teaching; (e) viability for inservice activities; (f) time commitment; and (g) support.

Home use. One of the ubiquitous themes that emerged from the synthesis of the data was that of home computer use and, incidentally, the relationship of gender to that theme. Ten of the 22 teachers in Carver III reported having a computer at home, and only one of these was male. Of the 11 teachers who exhibited sustained usage of computer mediated communication, seven commented on having a computer at home, including the one male. Figure 4 summarizes this theme.

	Number of teachers	Home computer	Sustained Users (S. U.)	S. U. with home computer
Total	22	10	11	7
Females	14	9	8	6
Males	8	1	3	1

Figure 4. Home use, sustained users, and gender.

Home use varied from basic word processing to personal experience with modems and telecommunications programs.

I own a IIE at home, and I knew Appleworks.

We have computers at home, my husband does a lot of computing also. Also I've had, I started out with a Commodore 20 in my room almost 15 years ago, 10 or 15 years ago, and I've had some Apples in the room, and lets see, what has it been, maybe 4 years ago I got an IBM computer.

We have Genie at home also. We had CompuServe for a little while. We tried out Prodigy for a little while. We didn't like that as well as AOL.

I use my (home name) name probably more than I do my other name because I usually, when I'm home I'm usually doing educational types of things you know, projects or something that the kids are working on. I did Scrapbook at the end of last year and whoa! That took a lot of work! And of course at the end of last year we ran out of grant money, it wasn't as much last year, so I'd take it home because we couldn't use the phone system here either, so we used it a lot at home.

We subscribe to it at home, because . . . I don't have to pay long distance charges, so its just my monthly fee, and then I use our subscription from home here at school.

Frequency of use. Another recurring theme which evolved had to do with frequency of use of AOL. Sustained usage of computer mediated communication involves use on a daily or near-daily basis. The most frequently stated use of the on-line service involved email.

There might be a day or two here and there that I miss, but, and sometimes its not a lot, sometimes I just go on and pick up my mail and send any mail I need to send and then I'm off again, but I'd say yeah, every day. You pretty much have to call in every day to get your mail and so forth. There are days that I don't, of course, when I'm real busy or whatever, but pretty much.

Yeah, every morning

Yeah, most every day. Sometimes just for checking my mail but we used to try to get into it at least a little

bit every day. Sometimes you became involved with something that reached your curiosity that particular day so that was kind of interesting. It was never the same day after day.

4 out of 5. there had to be some days that we didn't. On Fridays it was really hard because we had no extra time to do other things. I guess we had to be flexible for other things that came in. Like this morning we had a band concert.

Sharing experiences. A requirement for participation in this Carver grant was that the teachers would share their experiences with others, either by conducting inservice training or demonstrations on a group basis for teachers within their own district or individually with teachers who indicated an interest. Typically, the sharing took the form of in-service training of other teachers in their building regarding use of America Online in the classroom. In comparing those teachers who exhibited sustained usage with those who did not, it was found that 73% of the former group did indeed share their experience with others, while 45% of the latter group did so.

We try, and as more people want to know we show 'em. If they don't let us we don't show 'em. You may say that's selfish but why force them? Let's get to the people that want to know, they what to know, we're gonna show em, their gonna be using them. So when we're done with them they wanta do it. They don't wanta do it I guess you can't make 'em.

We had an inservice in this room, I remember that, it was in this room, 'course it had to be . . . it was a technology inservice is what it was, we went over a number of things, the liquid crystal display, and this [AOL].

Two years ago when we had it, the elementary teachers in this building, I showed them on-line conferences, a chat

type thing to get them acquainted . . . I finally got a card put in my new Mac 520, and it'll hook right into the TV so I can use the large screen TV now. I did that with the technology committee, they often come here for their meetings, and demonstrated Email and some of the different things on-line for them. We're planning on doing more of that for our inservices next year, now that we're a little more capable of doing that.

I did a district wide inservice, there were a lot of sessions set up the middle of the semester, the end of the first semester in January, and I gave two sessions and probably had 25-30 people attend the two sessions, and only one from within this building came, so it was all people from outside. within the district but outside this building. Some are interested in AOL, some are asking about NEA on-line and some of them have AOL on their own but don't use it in the classroom, and they're asking how much I'd used or if I was getting into the new area that's out, scholastic. I did a building inservice one night after school for any teacher who wanted to stop by and see what's going on, and there were a few that stopped by, some didn't stay very long, some stayed you know, as long as I could afford to stay, and they keep telling me they want more information but to get together and so forth it seems its harder and harder.

We put on little miniworkshops and showed the AOL. I think there were about 30 teachers that participated. We showed them what we were capable of doing. We also took it out and showed it, we have, we had what was called Excellence in Education days, sponsored by a Carver grant, in which teachers from all the buildings can gather together and set up booths and demonstrate some of the things going on, and we showed the AOL capabilities.

Yes, I did. I ran two different workshops that was k-12 where all the teachers could come in and then we also ran a night where the community could come in and see what was going on. We did share it with a lot of people.

I've done one for the AEA in all of (Area of) Iowa. I get really nervous about doing those things, but once you get rolling on it it just comes out.

Not only for our district but for several others. In the last two years I've done one for the [local] AEA. I

get really nervous about doing those things, but once you get rolling on it it just comes out.

Relevance to teaching. Perhaps an indication of the participant's commitment to computer mediated communication may be seen in their perception of the relevance of the Carver III project to their teaching. Their sense of how CMC fits into their school day could parallel their overall sense of how computer mediated communication fits into the overall educational process. Within the group which achieved sustained usage, 100% of the respondents to a query concerning the relevance of America Online to their teaching responded affirmatively. They saw this technology meshing with and enriching what they already were teaching, what they felt should be taught, and what they thought the future of education might be like, encompassing the global nature of education and the timeliness of this technology:

I think its timely, its relevant. Kids like it. We hear about global education all the time and it certainly is a way to have global education. Since I've gotten into it I feel like this is the future in communications. I think these students, its going to be commonplace for them to communicate like this. You can hardly pick up a newspaper or magazine without reading about on-line communications.

Up until this year the only area I said I couldn't tie it into was math, and when those on-line math games came along, and they were actually Olympic games to begin with, tied in with the Olympics, but we've been going on since the Olympics are over, so yeah, it fits into every area of the curriculum that you want to take the time to put it into.

Oh, its enriched it! There's just so much more I can offer my kids. Through using America On-line, because the school's been real supportive.

By contrast, 75% of those not attaining sustained user status replied in the affirmative when asked about the relevance of America On Line to their teaching. Those who replied negatively did so either because they thought it interfered with what they needed to be teaching, or they were not willing to expend the effort to make it relevant:

Sometimes I felt like I had to, stop what we're doing, we've got to go over and do the on-line stuff . . . so yeah, it didn't always integrate well.

I think it could have been more than what I allowed it to. Its kinda like uh anything else, you sort of take it for granted until its gone. I know there was so much more I could have used . . . I don't think it was anything earth-shattering for my teaching because I didn't use it enough to make a huge difference.

Viability for inservice activities. Most of the more successful group of teachers believed computer mediated communication to be a viable medium for teacher inservice activities. Examples cited included efficiency of time and travel budgets, increasing awareness, and expanding participation across district boundaries:

I think from our conferences and the stuff we've developed, you know, at our monthly meetings on-line, I think yeah they're very valuable. Again its a way to be able to communicate with other people that you can't travel to see because of time constraints or money constraints or whatever, so yeah, I think it'd be valuable.

I think its a viable means of increasing awareness, and keeping people in touch with changes in education. You have to stay current with technology, and I think communications are here to stay, so if you're going to become proficient at telecommunicating, AOL is a very definite line to accomplish that.



I think it would be more feasible for inservicing type situations, maybe cross-districts, across the state rather than within a district.

Yeah, that's the purpose, that's why we're mentoring these other teachers, to get it started in other places.

Those teachers who did not find computer mediated communication to be a viable medium for teacher inservice activities indicated a desire for face-to-face communication in interacting with other teachers.

I think you have to be with people and have the opportunity to instantaneously interact with people

I think its already too impersonal, you need to get together whenever you can

[The] conference is just really impractical, cause you can't raise your hand and ask a question, ah this and that, its just frustrating, and you know you feel like you're being rude to people and this & that on there if you butt in or you feel like you're eavesdropping.

Time commitment. The issue of time came up again and again in the journals, the conferences, and the interviews. All of the project participants agreed that the use of computer mediated communication added a new time requirement into an already full work schedule.

Most of the teachers reported spending either the same amount of time on the project throughout the first year or an increasing amount of time as they became more familiar with and aware of the capabilities and potential of the program.

I think the total amount of time that I'm spending has stayed pretty much the same, but in the beginning there was a lot more of my time spent looking to see what I could do with the kids. Now its actually more time spent with the kids doing something or something related to what the kids are going to be doing.

I spent more time because I did some things at the end of the year which more directly involved the kids.

I would say it probably was about the same. Well when we first got going I myself got on there and browsed around quite a bit. And once I was familiar with that and had the students on there then things just really started to level off. I didn't do as much with personal browsing through it, I just did the conferencing and let the kids get on there.

Oh, without a doubt! I spend a lot more time preparing for class just to do this, than I ever would before.

Actual time on line I did more toward the end of the year. For one thing I had more students involved in various projects and that took more time on-line, so as the year went by we had more kids involved so it did get to be more.

Regarding time use increasing throughout the year, little difference was evident between the sustained use teachers and the less successful group.

Only 6 of the 22 participants reported spending less time towards the end of the first year, and they typically attributed that diminishing of time either to their familiarity with AOL or providing more of the allotted time for their students and using less themselves.

I mean, as far as knowing what to do now and how to go in and do whatever we need to do, that takes less time because, you know, just knowing what you're doing

Oh, less time, because at the very beginning I was having to search and hunt and it was taking a lot more of my time -

The kids use went up, and my time went down.

In fact I have logged every minute that I spent here at school and at home. 60% of the time on AOL I used, and 40% of the time the kids used. So, I kept that record. But at the beginning it was a higher % that I was using

it than at the end. It switched around, at the end the kids were using it a higher % of the time.

The beginning. A lot more. I think that was a really big problem. I think I've resolved that problem now but it was a really big problem then.

Actually did it less, for a couple of reasons. First of all the curiosity part of it. You don't know what's out there and you want find out. You're more enthused about it. Not that I wasn't enthused at the end of the year, but the initial enthusiasm - plus we were limited by the number of hours we could be on. That took away from it. Plus you can manipulate it much more easily once you know where you're going. So with that you were able to get on and off and do your business a whole lot easier. Plus my curriculum just didn't allow it. I have certain things I'm supposed to be teaching and it was good to try to implement the AOL in with that, but to a point, there were some things that it couldn't be used for, and as my year progressed those things became more apparent. I would like to be using this but what do I weed out in order to use it and still reach all the requirements that the curriculum is asking me to teach.

So my time, I haven't spent as much on it now. I'm just the facilitator then with it. I'm there, but they're doing it.

Regarding time commitment decreasing as the year progressed there was also little difference evident between the group of sustained users and the group of non-sustained users.

The teachers involved in this project reported two basic methods of adjusting for the additional time requirement. Some used their own personal time, often coming to school early or staying late, and sometimes spending their weekend hours at the computer. Others "found" the extra time by changing the focus of their curriculum.

Thank goodness I have an understanding husband, because I would go home and fix supper and then we'd often come

back and work on the computer until 8, 10 o'clock at night getting things ready for the kids to do. Its really time consuming.

Just, yeah, I come in early each morning, I'm an early person, so I'm always here by 7:15 or 7:30. First thing I do is AOL, any mail I have to take care of, so I do it every morning. So time is a problem

I spend my Saturdays, the Saturdays and Sundays I'm not in graduate school, I'm here at school, and I normally wouldn't be here, I'd normally be at home.

I had to fight a lot with the kids for my time because when they heard that I was going on at 6:30 in the morning they were here cause they wanted to be a part of it or if they heard I was going on at 6 o'clock at night they were here

My own personal time...I don't have a computer at home, and I wish I did, I wish I had it at home, because then I could spend more time, so I'm either here until late at night or I'm here on Saturdays, and that's the way I fit it in, that's the way I had to do it, that often happens.

I think they're more personal related. As far as the curriculum is concerned, I usually find areas of America OnLine that will enhance or fit into the present curriculum, so I'm not teaching it as a separate thing, I'm teaching it as part of what I'm already teaching.

I would say most of my time was curricular. The majority of it had to do with my students and what I was doing for my students. If I had more time I would have liked to have spent more time personally, but there are only so many hours in the day and I always felt I needed to get done what they needed to do and if I had some time left then I would do some browsing on my own.

Well, they're just kinda used to mom goes to school on Saturday and works there, and I bring my kids sometimes too.

In discussing whether they took personal time or school (curricular) time in accommodating the additional requirements of the AOL project, little difference between

the group of sustained users and the group of non-sustained users was evident.

Computers are often viewed as tools that allow the user to get more work done than could be accomplished without the computer. Within the Carver III group, only four of the teachers felt that computer mediated communication actually helped them get more work done. Comments concerning the amount of time required to get one's work done were made frequently, however. The relationship between time and work and CMC was discussed in two ways: whether one could accomplish more work in a given amount of time and whether the work became a different type of work. Some saw the Carver III project as creating more work for them, while others saw it not simply as more work but as a different type of work, work which was more fun, more rewarding.

I don't think it allowed me to get any more work done, as a matter of fact, trying to get on-line, just to get on it, probably had to devote more time to that, just to get on it, so I definitely don't think its helped me accomplish more work to use it.

I don't know, I think I had more work to do because of AOL, but its different work, and its fun work. The kids enjoy it and I enjoy it. But I had more to do because of keeping up with the things on-line and so forth, it does add to my work that I do

It all takes that much more time, you can do so much more but you're spending that much more time. You spend as much time on it as you want to or you don't want to.

It took a lot of MY time to schedule the kids, and they'd often have to come in and work over the noontime in small groups. It was thoroughly time consuming trying to get everything done and still follow the curriculum that the school requires.

Its not going to save you time, it does take more time and you know you run into the pressures of desiring to complete the year curriculum and its gonna take additional time.

It creates more work, without a doubt. Things that I can't perceive that happen when kids get into it, I have to, we have to literally swing together - when I have a project I don't have any idea where its going to go. I have an idea of where I would like it to go, but it doesn't necessarily go that way.

It was a different type of work. When we went to The Great Email Race for example and we tried to get contacts from as many states as possible, we saved time in doing that as far as if we'd have actually mailed letters back and forth and so on, and the feedback I got from the kids was much greater in that sense as well. And I was replacing, taking some things out and adding some in too just to make sure I did use it and the kids were able to use it, I had to make some tradeoffs. As far as saving time, I wouldn't say a great deal, but in some cases.

Oh, it was different work. It makes more possibilities and resources available, so it can change the style of the work.

Support. All of the teachers agreed that support was extremely important as they implemented this new technology. Many of the participants commented on the excellent help available from the Carver III faculty.

The Carver staff has been very helpful if things don't go just right you send a note and somebody'll get back to you with some ideas of what's gone wrong.

The staff of AOL [meaning Carver III] were really great, and patient, and kind. Every time you had something go wrong they were very supportive and able to talk me out of any problems I had.

It's so easy to be in touch with the other people on-line, so long as everything's working, and it usually is, you know, I can send a note off to [project faculty members] and they usually get back to you and straighten you out on things.

Of course you had the ability to call them [project faculty] up and we, and I did that a couple of times, and so, and they were very helpful.

When queried as to whether or not it was important for a school to have a computer or technology consultant, all agreed that this was very important. Only one-half of the teachers reported having such a person available to them, however. Of the more successful group, the sustained users, 37% reported having a computer consultant, and within the less successful group 64% reported such support. While having a computer consultant available to them seemed important to these teachers, it did not bear positively on whether or not they attained the level of sustained usage. This finding contradicts other research (Becker, 1994; Bracey, 1993) in the area of technical support.

An explanation for this anomaly is revealed in an examination of the problems reported by the users. The group of sustained users exhibited a more intuitive nature in dealing with their computers and problems and therefore did not require as much help as did the less successful group. They were able to succeed in spite of not having in-house support. The majority of the sustained user group reported no problems or very few problems, and the problems they did report were primarily with things such as logging into AOL or with AOL itself rather than with their computer.

Not really. The biggest thing was when they were doing some tests, we shut down a couple of time for test.

Wednesday mornings when they are doing their updating of their files, but that was the only problems that we had.

Well, I can't think of anything, I mean sometimes we had trouble maybe calling in, but, you know it comes so natural anymore that I forget what.

Not too many to speak of.

No, we were very fortunate. Our modem, the original modem was in for repair, but we were fortunate to have another modem for backup.

There have been occasional times when I have had difficulty getting on line, but I haven't really had a lot of problems.

Sometimes America Online doesn't respond like they're supposed to, and that can be a problem.

In one case, where one member of a pair became a sustained user and the other did not, they reported two different perceptions of the same problems, the more successful teacher seeing minor problems and the less successful teacher seeing major problems.

We did have some problems with modems, but it was our modem and I don't know what happened, it just didn't work for us, we had to . . . borrow one from the high school, then we were able to order a new modem, so something happened , I suppose the equipment just gives out. As far as the America Online program, there have been occasional times when I have had difficulty getting on line, but I haven't really had a lot of problems.

yes, oh golly . . . something with our, our disk, it wouldn't, I can't remember now just what was wrong with it but it was just a horrendous problem, technical difficulties, that was really frustrating.

The less successful group tended to report more problems which they could not solve, sometimes even with the help of a computer consultant.



Oh yeah, yeah, and I was going to say there was even one time when we were doing all the conferencing, all of us were, and it was a complete shutdown. We had been trying to get a printer hooked up. We do have a computer person, I know that's one of your questions, for the district, and I'd had a work order in for them to come over because we think now the printer's not working right, but we never could get it working right.

My problems normally are not easy problems to solve . . . we do have a so - called computer person on staff but when it comes to my stuff that person has no knowledge at all.

Administrative support was another area which nearly all of the teachers agreed was important to the success of a project such as Carver III. Having a principal and/or superintendent who encourage their teachers to use computers meant a lot to these teachers, especially if the administrator then backs up that stated support with financial support.

Yeah, they're not only computer literate, they're computer supportive, if there is such a thing.

They are, they really pretty good as far as encouraging us to use computers. Where they fall back is the expense. I think they'd like to put a Mac in every classroom, but to do that is not cost effective at this point in time, so they encourage it but they also encourage us to find a way to fit it into our budget so that they don't have to fork out extra money,

He's been very supportive and gave us his Mac, his desk Mac, that's why he uses the little laptop, he gave us that so we'd each have one so we could do our AOL and everything.

Only one teacher specifically reported feeling a lack of support from the school administration. This person was not in the more successful group.

I think he's resistant to it although he's, he knows there's potential there but he's a little resistant. He resists, he doesn't see the potential there because the potential is thwarted by people not knowing how to use it.

Two of the teachers reported a supportive administrator as the primary reason they applied for the Carver III project. One of these two also reported that the administrator then became more involved with computer use in general so as not to feel outdone by the teacher!

Collaborative support within their building was another area which nearly all of the teachers felt was important. Fourteen of the teachers in this project were paired with another teacher in the same building. All but one of the teachers felt that such collaboration was an important factor in the implementation of the technology, primarily because of the opportunity to share ideas:

Just sitting down with another teacher and talking with them and thinking about where this can be used, just giving you ideas, sharing your ideas is so much better, because if you're all alone then you don't think of all the things you can do.

It was really important for (name) and I to work together. I don't think we could have gotten nearly as far, because what I didn't think of she thought of, and what she didn't think of then I would think of. We just used each other so much as resources. It was really a team effort.

For trouble shooting, if you have a problem somebody else who's at least familiar with what you're doing, just for batting ideas back and forth and that type of thing, the support, helping each other out, yeah I think I'd be a real advantage.

Well, I think it was very helpful to be together, because we could solve things together if we had a problem.

The one who did not attribute importance to collaboration had applied for the project with another teacher in the same building. As the project began, the other teacher announced that he would not be participating. Even though he lost his partner, the teacher elected to continue and felt that the project was very worthwhile and that his students benefited greatly. He was one who attained the level of sustained use.

With another pair, collaboration was responsible for both teachers being less successful. One of the two became uncomfortable with students' use of AOL and withdrew from the project after a few weeks. The collaborating teacher in the building then essentially withdrew from the project, contributing less and less as the year progressed. During his interview he acknowledged that when his partner dropped out he lost his motivation. He of course did not attain the level of sustained use.

It would appear that, although participants see collaboration as being important, it is not a determining factor in reaching the level of sustained usage. Initially, 64% of the teachers were paired. Of the teachers who attained sustained usage status, 55% came from paired groups. Of the seven paired groups, only two had both members reach

the level of sustained use, while in four of the paired groups neither teacher reached the sustained use plateau.

## CHAPTER V

## DISCUSSION AND RECOMMENDATIONS

Discussion

The purpose of this study was to examine interactions among a group of teachers involved in a computer mediated communications project in Iowa, to understand better those elements which may impact sustained usage of computer mediated communication. Through examination of existing journal postings and on-line conferences, plus personal interviews with the teachers, data were obtained which revealed commonalties and variances among these teachers as they utilized the on-line system. For purposes of this study, sustained usage refers to whether or not the teachers attained the level of "hooked" users as described by Tovey et al. (1990). Those who achieved that level were characterized by the researcher as "more successful" and those who did not were deemed to be "less successful" in the context of this discussion.

Due to the inductive nature of the constant-comparative research methodology, it was not possible to identify specific categories of investigation prior to the synthesis of data. Three general themes were identified at the outset as a guide for the researcher. These themes were:

1. What topics did the participants discuss while using computer mediated communication?

2. Were there differences in language used by the teachers in the public on-line conferences versus the weekly journals?

3. What were the reflective responses of these teachers when questioned about their involvement with computer mediated communication?

By using these general themes as a guide for considering the great diversity within the data, other categories emerged. Those categories which most impacted sustained usage are discussed in this chapter.

#### Risk Taking

The 22 teachers who participated in this study all exhibited a penchant for risk-taking simply by virtue of the fact that they applied for the project. The group which became sustained users were somewhat more reserved in how they perceived that inclination. The less successful group emphasized more strongly their propensity for being "on the cutting edge of technology", whereas the successful group did not see that as a major influence in their participation. For the more successful group the project appeared to be but another way to motivate their students.

#### Time

A common theme revealed in the synthesis of data had to do with time. All of these teachers were busy before engaging in the Carver III project, and that condition certainly did not lessen because of the project.

Means, Olson, and Singh (1995), reporting on efforts to restructure schools with technology, found that "A teacher's main source of time for learning about technology and designing technology-based activities was before and after school and on weekends" (p. 72). Variations in how willing these teachers were to invest extra time were evinced in a number of ways.

All of the teachers involved in Carver III made the commitment when they applied for the project to spend two weekends during the first year attending training workshops. Each of the 22 teachers in this study fulfilled that obligation. Many also reported spending additional weekend hours working on project-related activities, particularly those who indicated use of a computer at home.

Many of the teachers also reported spending time before and after school preparing for project-related activities, including journal postings. The requirement of posting a weekly journal entry was a known factor before the teachers began this project, yet none of them closely approached the 24 postings requested for the first year. Virtually all of the teachers indicated that they did their journal postings during times when the students were not present, including time before and after school. A specific indicator of willingness to devote extra time may be seen in the number of journal postings which the teachers made during the course of the year. The greatest number of journal postings from the

22 teachers was 10. The mean for the group of sustained users was 6.36 while the mean for those not achieving sustained use was 4.75, characterizing a greater degree of dedication to the project on the part of those teachers who did attain the level of sustained use.

A dramatic reduction in postings was evident following the Christmas/New Years holiday period. Fewer teachers posting naturally produced fewer responses to the postings. This cascade effect resulted in the cessation of all posting by the 18th week of the project.

#### Gender

Gender has long been associated with the degree of success or failure of computer users (Becker, 1994; Kiesler et al., 1984). Becker found that "the gender of a teacher was still among the stronger independent predictors of exemplary computer-using teachers" (p. 311) with males overrepresented nearly two to one. Becker also reported that "the greatest difference between male and female teachers was in the amount of time they spent using computers" (p. 311), particularly the amount of time spent using computers at home.

In this study, the finding was that males were less successful than females, with the percentage of males in the group of sustained users being appreciably smaller than the percentage of males overall. Since only one male reported having a computer at home and he was in the more successful



group, home use may account for this gender contradiction of other studies. Further study is recommended to explore relationships between sustained use, gender, and home use.

#### Personal Sacrifice

Any realistic study of the history of education in the United States will demonstrate that "rural schools are an important part of the national scheme of schooling in the United States" (Howley & Howley, 1995, p. 128). Iowa is undeniably a rural society, and Iowa's schools are predominantly rural in nature (Howley & Howley, 1995; Luck, 1992; Sher, 1995; Theobald & Nachtigal, 1995). As is the case nationwide, Iowa schools are looking to technology as one means of "meeting the 'needs' of the children in our nation's schools" (Theobald & Nachtigal, p. 134). Sher stated "American education is in the midst of an age of new paradigms, new research, new standards, new policies and practices, and new models" (p. 144). Howley and Howley described how technology may appeal to educators: "American culture values almost anything that is new, and the new technologies are certainly seductive. Their allure lies in the promise of innovation without sacrifice" (p. 129).

A willingness to sacrifice was evident within the group of sustained users, who demonstrated a proclivity to give up their personal time in implementing this innovation. Hoversten (1992) found that effective middle-level teachers "are willing to work long hours and make personal sacrifices

in order to provide students with meaningful learning experiences" (p. 169). While this researcher has no reason to doubt that all of the participants in this study are hard working teachers, there is also no doubt that the more successful group showed a greater willingness to devote the extra personal time, usually before and after school and on weekends, necessary to make the new technology succeed for their students. This finding correlates with the findings of Becker (1994) regarding the use of personal time: "Exemplary computer-using teachers spent more than twice as many hours personally working on computers at school than did other computer-using teachers" (p. 307).

#### Continued Utilization

The Carver III project was an attempt to infuse a new technology, computer mediated communication, into a number of schools around the state of Iowa. It was a valiant effort, well organized and well executed. The Carver Trust is to be commended for funding the project, and the project faculty complimented for their dedication and leadership. The participants, both the teachers and the students in their classes, undoubtedly gained tremendously from the experience.

In discussing the Carver III project with the 22 teachers, it became evident that, among the group which did not achieve sustained use, few were still utilizing computer mediated communication to any significant degree. Such seems to be the fate of many grant-funded projects in schools.

In discussing grant possibilities with representatives of a major telecommunications corporation (personal communication, November 15, 1995), it was stated that the corporation was no longer interested in funding isolated projects (similar to Carver III) without a commitment from the participating school to continue the project after the corporation completed their involvement. The rationale which the representatives shared was that the corporation has found that such projects have little, if any, long-term impact without local commitment. Schools often participated in order to obtain equipment, but little effort was made to proceed after the grant money was expended.

It would appear that a similar fate has befallen the America OnLine Telecommunications Project (Carver III). Lacking a firm commitment from the local district to continue the effort, any project is likely to disappear shortly after the initial funding and ancillary support stops. Means et al. (1995) addressed this aspect of innovation in schools:

We need to recognize that it is one thing to use technology in isolated classrooms and quite another to make technology a potent force in transforming an entire school or an entire education system. All schools that choose to make technology part of their reform strategies face important challenges with respect to physical infrastructure, funding, equity, and ongoing maintenance. But our case studies suggest that the deciding factor in successful implementations of technology is the creation of a coherent *schoolwide* approach to using technology in the core curricula for all students. (p. 70)

Bracey (1995) stated that:

One-fourth of American students said that they did not use computers in any subject area and another one-fourth indicated that they used them in one curriculum area only.

Sometimes this lack of use can be attributed to the infrastructure, but it is more likely attributable to the fact that teachers and administrators do not yet view computers as central to instruction. (p. 159)

Becker (1994) reported that "exemplary [computer-using] teachers worked in school districts that had invested heavily in staff development and on-site staff support for computer-using teachers" (p. 305).

No indication was given from any of the teachers in this study that their school district had committed to any ongoing support for computer mediated communication beyond the initial one or two years. Within the Roy J. Carver Charitable Trust America OnLine Project (1995) final report issued by the project leadership cadre there was also no mention of continuing support on the part of the schools which had teachers involved.

In order for a project of this nature to impact teaching and learning within a school or district, a consensus must develop regarding instructional goals and activities that support such goals. Means et al. (1995) state that "what appears to be important is not the point at which technology becomes a part of the vision but the coherence of the vision and the extent to which it is a unifying force among

teachers" (p. 71). No such "vision" or "unifying force" was evident in any of the schools in this project.

The coherence of a vision for technology must also include support for the infrastructure. All of the participants in Carver III agreed that a technology (computer) consultant was an important form of support for a school district to provide. In spite of this perception on the part of these teachers, those who did have a paid support person available to them did not achieve the level of sustained usage in as large numbers as those who did not have a support person available to them. This researcher is of the opinion that this contradiction of the participants' perception of the importance of support, as well as other research addressing this factor (Becker, 1994, Bracey, 1993), stems from the fact that the teachers who did become sustained users exhibited a more intuitive nature in dealing with CMC technology, and therefore had less need for local help. These sustained users also showed more initiative in asking the project faculty and other participants for help when they did need it.

#### Applicability

At the time Carver III was proposed, computer mediated communication within Iowa elementary and middle schools was a fairly new and quite rare concept. Many schools had only one or two telephone lines into the building, usually leading to the office area. Separate telephone lines into individual

classrooms were a very rare occurrence. Modems were few in number and slow in operation. Attempting to conduct a class session utilizing computer mediated communication was rare, and on an organized basis it was unheard of.

It would be pleasing to report that all of that has changed since 1992. Unfortunately, that is not the case. In visiting with teachers at state conferences and delivering workshops to Iowa's educators as part of the Iowa Educational Technology Training Institute (IETTI), this researcher is finding that many, perhaps most, of Iowa's elementary and middle school buildings still have less than adequate telephone service. The majority of these buildings are old and difficult to wire. Separate telephone lines to individual classrooms are still not common. Modems are faster, but still somewhat scarce in schools. Siebert and Villanueva (1996) stated "Most Iowa classrooms aren't even equipped with telephones--let alone computers with modems" (p. 1A) In essence, things have not changed much in the last four years.

The future is far from bleak, however. Iowa has committed large sums of money to install a state-of-the-art fiber optic network throughout the state. This network, the backbone of the Iowa Communications Network (ICN), has only within the last few months begun to offer connections to the internet, the computer network linking virtually every part of the world. As these connections become available to more

and more schools, the dependence on modems and telephone lines for computer mediated communication will diminish rapidly. As of Fiscal Year 1995 (FY 1995) at least one ICN Point of Presence (POP) existed in each of Iowa's 99 counties. During FY 1996, 93 additional school buildings will be connected. In FY 1997 130 more school buildings will have ICN connections. FY 1998 will provide connections for 120 additional school buildings, and FY 1999 will see 34 more school buildings connected across the state (Iowa Educational Technology Training Institute, 1996). Schools have already begun to equip computer labs with the capability to access the internet utilizing the ICN. The problem of old buildings which are difficult to wire remains, but as that problem is resolved the means to provide network connections to the classrooms within these buildings will exist through the ICN. The teachers are willing to do what is necessary to accomplish this. Graham (cited in Siebert & Villanueva, 1996) stated "A lot of them are willing to do it because they're doing it on their own. They're taking classes on Saturdays" (p. 3A).

During the past 24 months this researcher has had the opportunity to travel to seven states and discuss technology implementation within their schools. In every case the people talked to expressed their envy of the ICN, praising the Iowa governor and legislature for their farsightedness in promoting construction of this network. The consensus was

that Iowa, with an ICN Point of Presence in every county, has the finest communication network in the country at the present time, and will undoubtedly continue in that position as the ICN is extended to more and more schools.

This connectivity will allow Iowa's schools to connect in large numbers to the internet and utilize the vast resources of the World Wide Web. During the last nine months this researcher has conducted many workshops for the IETTI in Iowa, demonstrating the capabilities of the World Wide Web for classroom use. Interest is extremely high among Iowa's teachers in learning how to access "the web" and employ its resources in their classes. The motivating factor for virtually all of the teachers attending these workshops has been to discover how they can help their students. These are the "early adopters," and they are emerging in extremely large numbers across the state. In the area of computer mediated communication at least, it would appear that Iowa's teachers are drastically shortening what Rogers (1983) referred to as "mean-time-to-adoption" (p. 238) from 25-30 years to 2 to 3 years.

This study is as applicable today as at any time during the last four years. Because of the early interest developed around projects such as Carver III, the connectivity provided by the ICN, and the extensive publicity regarding "the web", the future of computer mediated communication in Iowa seems assured.



### Recommendations

This study investigated factors impacting sustained usage of computer mediated communication by Iowa elementary and middle school teachers. Based on the Review of Literature and the data collected, the researcher made the following recommendations:

1. More than one year must be provided for teachers to learn and integrate a new technology into their teaching methodology. After providing initial training, and allowing for the inevitable technical glitches which occur, one school year is not sufficient time to realize the type of gains necessary to motivate most people to continue.

2. Isolation can occur within both urban and rural settings. Most of the teachers in this project commented on the advantage of being paired with another teacher. Schools should encourage a team approach to reduce this isolation. Teams should be monitored closely for both exemplary behaviors which may be showcased to others as well as negative influences which may prove to be detrimental to the team. Support should also be available for the fledgling technologists from outside the teachers' immediate surroundings. Such support should come from a person or persons familiar to the participants, someone whom the teachers have personally met and with whom they have worked. Assistance would ideally be available through a number of

electronic media as well as in person. When learning a new technology or methodology, the reassurance of personal contact cannot be over-emphasized.

3. Providing someone within the building for technical support of hardware and software is very important. This is a responsibility of each school, not of an external entity that may be funding a specific project. Many schools have spent a considerable amount of their discretionary funds over the last decade supplying equipment for their teachers and students. Support for this complex and expensive hardware and software must be provided. Unfortunately, "For most, technology coordinator is an add-on job much like coaching or helping with the yearbook" (Siebert & Villanueva, 1996, p. 3A).

4. Schools must make adequate time available to teachers who are attempting to integrate new technologies into the curriculum. Without specific time during the work day allotted for learning and utilizing the new paradigms involved, only a small percentage of teachers with very high levels of intrinsic motivation will persevere. Buenz (cited in Siebert & Villanueva 1996) fears that "this might not change until drastic changes are made in the school calendar. It shouldn't be just a one-shot deal" (p. 3A).

5. In order to provide maximum potential for success in projects similar to Carver III, applications should be solicited not only from the teachers who indicate a desire to

participate, but also from the school districts that employ the teachers. This application from the school district should contain statements reflecting: (a) the school's vision for technology and technology-related curriculum support; (b) a willingness to incorporate project materials across the curriculum, including changes to the curriculum which become necessary as the project progresses; and (c) a commitment to provide financial support for the project beyond the sponsoring organization's funding period.

Failing to address local circumstances and commitments similar to those outlined above will, in all likelihood, confine any project to short-term gains rather than providing meaningful, lasting effects.

6. Adequate funding must be provided for the recommendations described above. Since under Iowa's school funding procedures the majority of a schools' budget is appropriated by the legislature each year, it becomes the legislature's duty to provide additional funding for technology. As of this writing, the Iowa legislature has provided special funding for technology to each district over the next five years, and the governor has signed the legislation. However, the legislature should also allocate funds on an annual basis into an ongoing fund to be used for special projects such as Carver III. This fund should be administered by the State Department of Education. Districts would then submit proposals for innovative projects such as

Carver III to the Department of Education. So as not to discourage school districts from applying to private organizations such as the Carver Trust, these funds should be allowed to supplement private grants as well as fund new projects.

7. Additional research is needed regarding attitudinal attributes of technology using teachers. Screening for attitudes such as commitment toward established goals, degree of narcissistic disposition of volunteers, and willingness to expend personal time may provide additional insight insofar as maximizing the potential for success of such projects.

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APPENDIX A

CARVER III PROJECT PROPOSAL

# National Geographic Society

WASHINGTON, D. C. 20038

## Using On-line Services to Enrich Staff Development for Iowa Teachers A Proposal to the Roy J. Carver Charitable Trust

"By the year 2000, I want to see America Online  
in every faculty room in the United States"

*Mickey Terry  
Director, Staff Development  
Association for Supervision and  
Curriculum Development*

### Proposal Summary

The National Geographic Society Education Foundation is requesting a 24-month grant of \$55,228 from the Roy J. Carver Charitable Trust to enrich staff development for Iowa teachers through telecommunications. Funding will enable 35 educators throughout the state to create and exchange lesson plans, disseminate software stacks, and share tips about teaching methods and materials. The project will reinforce and cross-fertilize training efforts currently underway through the Geographic Alliance of Iowa, Kids Network, and GTV.

### Goals

With only a modest investment, the project will meet a number of goals deemed important by Iowa's teachers, Iowa's State Department of Education, the Iowa Geographic Alliance, and the National Geographic Society. Together we share a desire to:

- o increase teachers' skills in using technology for educational purposes;
- o enhance teachers' professionalism by linking them to a broader universe of educators and resource materials;
- o provide greater flexibility in the way in which staff development takes place;

- o produce and disseminate instructional materials, such as lesson plans, software stacks, and teaching tips;
- o encourage greater interaction among teachers of various disciplines; and
- o reinforce training programs currently supported by the National Geographic Society and the Carver Trust.

### Scope of Work

The project will begin formally in the spring of 1992 and run through the spring of 1994. A scope of work and timetable follows.

#### (1) Spring 1992:

Selection of Teachers: Twenty teachers across Iowa will be selected to participate in the first year of the program. The selection process will be in two phases:

- (a) names of interested teachers will be forwarded to the local Iowa steering committee and weighed against established criteria (see below); and
- (b) recommendations will be forwarded to NGS for final selection.

Criteria: Through this project we want to develop a cadre of "lead teachers" who can spread their knowledge and enthusiasm about the usefulness of on-line services to other educators. To that end, we will concentrate our resources during the first year on teachers who have already exhibited both an interest and general competence in educational technologies. We expect that most participants will be teachers of geography, social studies, history, and science, and that many, although not all, will have participated in GTV, Kids Network, and Geographic Alliance projects. Enthusiasm and leadership abilities will be paramount.

Also, we will ask that each teacher have access to a computer, phone line, and modem. (No equipment will be provided.) Lastly, each interested teacher must agree to attend a one-day training session and a follow-up workshop, and to conduct shorter demonstrations of on-line services for administrators and teachers at their schools.

#### Summer 1992:

Training: During the summer, program participants(\*) will assemble for a one-day training session in a central location in Iowa. The session will provide a thorough overview of:

- (a) on-line services and capabilities
- (b) how on-line conferences can be useful to educators
- (c) how software stacks, teaching materials, and lesson plans can be shared,
- (d) how teachers and students can use on-line services as a general reference tool, and
- (e) the general protocol of on-line use.

\* 20 teachers, four "lead" teachers, a local program coordinator, and the Geographic Alliance representative

Follow-up: The workshop will also review follow-up requirements. Participants will be required to:

- (a) attend four on-line conferences (two per semester)
- (b) attend a follow-up workshop mid-way through the project
- (c) provide an on-line demonstration for administrators and teachers at their schools
- (d) produce a lesson plan(s) to show other teachers how they can enhance a subject they are currently teaching by using on-line services. These plans will be included in a "booklet" for use by other teachers, and will be disseminated on-line and by hard copy.

#### **Fall 1992 - Spring 1993:**

On-line Staff Development: Teachers go on-line and participate in conferences, conduct demonstrations for their peers, and develop lesson plans for distribution via telecommunications.

A follow-up workshop will be held for all participating teachers. Because this will be at participants' expense, we will try to find a time and place (such as a pre-existing forum or Alliance conference) that is convenient to a majority of the teachers.

#### **Summer 1993:**

Program Expansion: A group of ten teachers will be added in the second year of the project. Criteria for selection will be patterned on that of the first year, but with more flexibility to encourage greater interaction among disciplines, including science, math, geography, English, foreign language, and history.

A training workshop will be held during the summer, which will be restricted (for budgetary reasons) to new teachers only.

#### **Fall 1993:**

Staff Development Continues: All teachers (both first- and second-year)

go on-line and participate in conferences, conduct demonstrations for their peers, and develop lesson plans for distribution via telecommunications.

A follow-up workshop will be held for all participating teachers. Because this refresher will be at participants' expense, we will try to find a time and place (such as a pre-existing forum or Alliance conference) that is convenient to a majority of the teachers.

#### Spring 1994:

On-Line In-service Booklet: Although the materials generated by the teachers will be used as the project evolves, there may be a need in the spring of 1994 to refine them so that they can be used more broadly by other teachers in the state. Any necessary editing and formatting would be finished by the end of the project period.

#### Rationale

The inclusion of America Online services in our GTV and Kids Network projects has stimulated considerable enthusiasm among participating teachers. We have, for example, witnessed a new and very productive level of interaction. The benefits of on-line services are solid: (a) through the exchange of lesson plans and teaching tips, teachers no longer have to create materials from scratch, but can build on, and tailor, the work of their colleagues; and (b) by using on-line services, which are flexible and inherently friendly, teachers are achieving new kinship with a community of educators and citizens far broader than what is possible through most formal training programs. We hope to end some of the isolation that teachers experience as a result of traditional educational methods.

Following a demonstration of GTV at a meeting conducted by the Eastern Iowa Media Specialists, Bob Furino, a GTV participant and proposed lead teacher in this project, supported these arguments clearly:

"AOL really seemed to catch the imagination of these people. When I told them about the 'Stack Exchange' where we exchange shows, they were very receptive. I think that they were seeing that they would be able to find things there to use for their students, and that they would not have to re-invent the wheel each time they needed a show for a particular unit."

Unfortunately schools--and classrooms in particular--are poorly served by the lack of telecommunications. Typically the only access line is in the principal's office, virtually inaccessible to teachers and completely unavailable to students. At a time when on-line services are becoming routine tools of business, this deprivation is all the more keenly felt by our schools. Through this project, we feel confident that Iowa's teachers will grow, both professionally and personally, and that they will be better able to acquaint students with the tools they will use when they enter the workforce.

### Project Partners

**National Geographic Society:** The National Geographic Society Education Foundation will administer the grant. Staff from the Society's Educational Media Division and Geography Education Division will work with the Iowa team to help ensure maximum coordination between this project and other efforts in which the Carver Trust and the Society are involved (Kids Network, GTV, and the Alliance). The Society will monitor the project closely with the hope that it can be replicated in other Alliance states as a model for on-line staff development.

**Local Program Committee:** We will establish a local committee to run day-to-day program operations. Patty Achey-Cutts, state representative from AEA #7, will coordinate operations. Marsha Gookin, a teacher from North Tama Elementary School in Traer, Robert Furino, a teacher at Carpenter Elementary School, Ty Ann Moorhead, computer coordinator at New Hampton Middle School, and Sharon Smalldino, associate professor of curriculum and instruction at UNI, will serve as lead teachers for purposes of workshop training and on-line support.

**Geographic Alliance of Iowa:** Based at the University of Northern Iowa, the Alliance conducts teacher training, curriculum development, and public awareness programs throughout the state. Although a fledgling organization, it has the full support of the National Geographic Society and is our designated vehicle for reaching Iowa's elementary and secondary school teachers. The Alliance will participate in this project with the explicit goal of tying participating teachers to the Alliance's state-wide training program. For example, we propose to convene special "on-line training sessions" at the Alliance's summer institute and at Alliance meetings throughout the year. Iowa's Geographic Alliance co-coordinators will be the principal contacts for the project.

APPENDIX B

PILOT INTERVIEWS



6/18/93 10:03:45 AM Opening "Chat Log 6/18/93" for recording.  
You have just changed to room "Lobby".  
You have just changed to room "uni".

Phil : Hi, Mary!!  
MaryP IA : Oh Good!  
Phil : Finally! A person can get lost in this maze.  
MaryP IA : Sure can!  
MaryP IA : It stirs up the nerves  
Phil : I wasn't even sure I was going to make it - my modem  
picked this morning to act up!  
MaryP IA : That's technology..great when it works  
Phil : Well, I suppose we should get started.  
MaryP IA : Sounds good.  
MaryP IA : I'm ready  
Phil : First question: What kinds of computer experience  
did you bring to the Carver III project?  
MaryP IA : I have had little formal training. I use word  
processing and MECC disks  
MaryP IA : I have worked mainly with an Apple IIGS  
MaryP IA : I have taught fourth graders Fred Writer and Apple  
Works & NGS Kids Net.  
Phil : So you've had some computer experience. Any  
experience with on-line services?  
MaryP IA : No. On-line services was entirely new to me.  
Phil : Are there any particular experiences within the  
project that make you more comfortable with  
Phil : computer conferencing?  
MaryP IA : The training we received from the faculty and trial &  
error mostly  
Phil : Trial & error is a great teacher, isn't it?  
MaryP IA : Yes. and your really remember those times, too.  
Phil : (Not that the faculty weren't great too!!)  
MaryP IA : Yes, they were always helpful.  
Phil : Have you gained any related experience outside of the  
project which enhances your computer  
Phil : conferencing abilities?  
MaryP IA : I have conferenced with a teacher in Ohio.  
Phil : When you say "conferenced",what do you mean?  
MaryP IA : I met her through a meeting with NGS tutor and she  
wanted to know how we used  
MaryP IA : AOL.  
MaryP IA : She gave me some information to write for through a  
telephone company.  
Phil : Did you mainly use E-mail, or did you use some of the  
other AOL features (like this "chat")?  
MaryP IA : First I used the Chat, then e-mail.  
Phil : Have you used AOL for anything else, like just  
browsing the features?  
MaryP IA : Yes. I have browsed CNN, PET information, Tourist  
information to name a few  
MaryP IA : I even went to the front row of a game show  
MaryP IA : It was called Baby Boomers  
Phil : We talked earlier about the problem of time. Do you  
spend more, less, or about the same amount of  
Phil : time now as when you started?

MaryP IA : I spend much less time. I know where I want to go and get there & out as quick

MaryP IA : quickly as possible.

MaryP IA : I had my students very well organized after a month or so & their time was less

Phil : Well, I guess that's what we would all hope for, isn't it!?!?

MaryP IA : Yes. At the beginning I spent as much as 45min for Student to Student

Phil : Do you think that using AOL allows you to accomplish any more "work" than before?

MaryP IA : student work or teacher work?

Phil : teacher work (personal)

MaryP IA : I used it to enhance the units I was teaching. I wanted my students to be able

MaryP IA : to use it as another resource in the classroom.

Phil : does AOL enhance what you do or does it ever "get in the way"?

MaryP IA : I found new units in science. It enhanced what I did. I did not use it as

MaryP IA : a separate lessons, but integrated it into the regular work.

Phil : Would you say that time constraints are more of a personal factor or a school (curricular) factor?

MaryP IA : School curricular factor!

Phil : Did AOL just "add in" to your school schedule, or did you have to replace something else?

MaryP IA : After the students were trained to use AOL, it was a part of regular schedule

Phil : Do you use AOL every day? (Personally)

MaryP IA : I had a Jr. High helper to help train the fourth graders.

MaryP IA : I do not personally use AOL every day. However, I used it on a regular basis e

MaryP IA : either by going into school early or at home.

Phil : Student helpers are (usually) great!

Phil : Do you use the computer every day for other things?

MaryP IA : I had a super computer helper.

MaryP IA : Students use the computer almost every day. I use it daily during sch. year.

Phil : Did you use up your allotted AOL time this year?

MaryP IA : I used more than the allotted time. As I said, at first the 4th graders typing

MaryP IA : skills were slow, then we changed to a Mac.

Phil : Are there many other "computer using" teachers or administrators in your building?

MaryP IA : I felt I had the program to use and children who were highly motivated so I use  
You have just changed to room "UNI".  
Phil : We're back!!  
VickiB IA : Hi Phil  
Phil : High Vicki  
Phil : (or HI)  
VickiB IA : LOL  
Phil : Did you get logged off too?  
VickiB IA : YES  
Phil : Do you have call waiting?  
VickiB IA : No  
Phil : Neither do I. Wonder what happened!?!  
Phil : Is this Mary or Vicki?  
VickiB IA : Vicki  
VickiB IA : We thought you told Mary Bye.  
Phil : I had a few more questions for Mary - can she come back on (she can use your login)  
VickiB IA : Yes that is fine. Here she is.  
VickiB IA : Hi this is Mary.  
Phil : My names not right, no reason why Mary's name has to be!  
Phil : I was going to ask you if there are many other "computer-using" teachers in your building?  
VickiB IA : YES, all of our teachers,  
Phil : Have you shared your AOL experiences with them? If so, how?  
VickiB IA : Yes, demonstrations, open house format, screamed news from Russia down the hall  
Phil : talk about first hand information!!  
VickiB IA : and the science teachers curriculum class for our district.  
Phil : Do you see having someone else in the same building who is also in the project as an advantage, a  
Phil : disadvantage, or of no consequence?  
VickiB IA : Definately!!! an advantage.  
Phil : Why?  
VickiB IA : We pinch hit for each other. What one forgets the other remembers.  
Phil : Does your school district have a full-time computer (technology) coordinator? Part time?  
VickiB IA : We bounce ideas off each other constantly.  
VickiB IA : None, we go for it ourselves. We're pioneers.  
Phil : Good for you!!! Do you wish the district did have a tech consultant?  
VickiB IA : No  
Phil : Why not?  
VickiB IA : We have a supportive principal who has a dream for our school in technology.  
Phil : That helps!!

VickiB IA : A consultant would take more money and not filter down as useful.

Phil : Does your school provide any staff-development activities relating to computer use?

VickiB IA : Yes we were given the chance to visit another school using technology.

Phil : Do your administrators support computer use only for "learning goal" types of activity, or for other

Phil : activities such as year book, email, etc?

VickiB IA : Our principal would like to have the computers in use at all times for various

VickiB IA : learning and use as tools.

Phil : Are teachers allowed to take computers home?

VickiB IA : Yes anytime.

Phil : What do you see as the advantages to using AOL as part of your teaching methodology?

VickiB IA : We are in contact with people all over the world and this helps our kids

VickiB IA : understand how people are alike and different.

Phil : That's a really neat thing about this type of service!

VickiB IA : It also makes them so comfortable in using technology everyday.

Phil : You mentioned it helps the kids; do you see any personal or professional advantages to using AOL?

VickiB IA : Yes, sharing ideas with other colleagues.

Phil : Do you see AOL or similar services as a viable delivery system for staff development?

VickiB IA : I think it is important that all teachers know about this and made available

VickiB IA : to all teachers at a convenient location.

You have just changed to room "UNI".

Phil : I got logged out again!!

Phil : This is frustrating.

VickiB IA : We noticed this time.

Phil : Well, glad you waited for me!!

Phil : Let's see, where was I - Would you continue to use AOL personally if you had to pay the charges yours

Phil : yourself?

VickiB IA : Possibly.

Phil : Are you aware of other on-line services, either commercial or non-commercial, which are available?

VickiB IA : Yes but I don't know the names right now.

Phil : Have you ever heard of "the internet"?

VickiB IA : Yes, we got a letter from Russia.

Phil : neat!

Phil : As regards this interview: do "typos" bother you?

VickiB IA : No not a bit.

Phil : Do you find the time delay between responses annoying or objectionable?

VickiB IA : no

Phil : Well, Mary, this took a little longer than I anticipated, but we got through it in spite of

Phil : the marvels of technology glitches!

Phil : Thanks very much for your input.

VickiB IA : Another learning experience.  
Phil : Can I switch to Vicki now, please?  
VickiB IA : I hope I have been of help.  
VickiB IA : Yes, here I am.  
Phil : Well, we'll see how this part of the session goes!!  
VickiB IA : OK  
Phil : First question: what kinds of computer experience did you bring to this project?  
VickiB IA : Kid's Net, word processing, IBM and Apple IIGS, a few college courses  
Phil : It all helps, doesn't it!?  
VickiB IA : yes  
Phil : Are there any particular experiences within the project which have helped make you more comfortable with computer conferencing?  
VickiB IA : The training and working as a team.  
Phil : You mean the meetings which you had?  
VickiB IA : yes the meetings at Cedar Falls and working with MaryP.  
Phil : OK Have you gained any experience OUTSIDE of the project which has enhanced your computer conferencing expertise?  
VickiB IA : Not really.  
Phil : Do you use AOL for non-project related things, like browsing, email, etc.?  
VickiB IA : yes. some, downloading units, email, book chats, encyclopedia use, writing proj  
VickiB IA : ects  
Phil : Ever just "wander around" within all of the different departments etc.?  
VickiB IA : yes  
Phil : Would you say you spend more, less, or about the same amount of time on AOL now as when you started?  
VickiB IA : Less time, our \$\$\$ is gone, gone, gone.  
Phil : Less just because of the \$\$ (not that that'  
Phil : s not important!!!)  
VickiB IA : I've been busy getting my master's degree, and did not have AOL set up at home.  
Phil : Do you think that using AOL allows you to accomplish more "work" than before?  
VickiB IA : No  
Phil : did AOL just "add in" to your school schedule, or did you have to replace something else?  
VickiB IA : add in  
Phil : do you use AOL every day?  
VickiB IA : no

Phil : about how much time do you spend on AOL each time that you do use it?

VickiB IA : 1-2 Hours

Phil : Other than AOL, do you use the computer every day?

VickiB IA : No but often each week.

Phil : Are there many other "computer-using" teachers or administrators in your building?

VickiB IA : Yes, all of them.

Phil : Do you think that it's unusual for ALL of them to be computer users?

VickiB IA : Yes

Phil : Why do you think that all of them are users?

VickiB IA : Because of our principal's support and provision of equipment.

Phil : Have you shared your AOL experiences with them?

VickiB IA : Some of them.

Phil : Anything formal?

VickiB IA : Yes with the principal and I arranged for Mary to present at the Science Class.

Phil : Some of the Carver III pproject members have someone else in their building also in the project.

Phil : do you see this as an advantage, disadvantage or of no consequence?

VickiB IA : It is definately and advantage. We have supported and encouraged each other.

VickiB IA : This next year Mary was not selected and we have always worked as a team.

Phil : Does your district provide any sort of a paid staff support person for technology?

VickiB IA : No

Phil : Back to your last response, are you going to participate next year?

VickiB IA : Yes, but I would like for Mary and I to do it together.

Phil : Does your district provide any in-service activities regarding computer use?

VickiB IA : Not hte district.

Phil : Building?

VickiB IA : Yes some of us have checked out computer use at Cherry Creek, Colo., and CCC

VickiB IA : information and a Saturn School of tomorrow in St. Paul.

Phil : Did you go to Colo?

Phil : Or St. Paul?

VickiB IA : Yes, I did.

VickiB IA : Both.

Phil : That's great!!!

VickiB IA : Yes it was a great learning experience.

Phil : I got to go to Marshalltown once when I was teaching.  
;-(

VickiB IA : We learned what doesn't work as well as what does.

Phil : Does your DISTRICT encourage taking computers home, or your building principal?

VickiB IA : Yes, definately our principal does.

Phil : Do many teachers do that?

VickiB IA : Yes, almost all who do not already have computers.  
Phil : What do you see as the advantage(s) to using AOL as part of your teaching methodology?  
VickiB IA : It acquaints students with the opportunity to use technology in communicating  
VickiB IA : with other students and adults anywhere in the world, and offers them many  
VickiB IA : resources at their fingertips that would otherwise not be available.  
Phil : How about personal or professional advantages ?  
VickiB IA : Yes, it offers me the opporetunity to communicate with other teachers  
VickiB IA : about lessons, problems, opportunities etc.  
Phil : Do you think that AOL or other similar conferencing systems would be a viable delivery system for staf development activities?  
Phil :  
VickiB IA : Maybe  
Phil : Why maybe?  
VickiB IA : It does cost and its slow typing in info.  
Phil : Would you continue to use AOL if you had to pay the charges yourself?  
VickiB IA : Maybe  
Phil : Do you know of other on-line services, either commercial or non comm. that offer similar services?  
VickiB IA : It would depend on the cost and whether I have a computer with a modem at home.  
VickiB IA : No  
Phil : Is it important to you to be able to work at home ?  
VickiB IA : Yes, time at school is limited and much of it needs to be spent with kids.  
Phil : Are you aware of the "internet"?  
VickiB IA : Yes, we received a letter from Russia.  
VickiB IA : Also Bob Furino told us about it.  
Phil : Supposedly Minnesota just paid to connect all public schools to the internet. What do you think  
Phil : of Iowa doing something similar?  
VickiB IA : It would be fantastic. The kids really need to find out how small the world  
Phil : Even at a cost of about \$500,000?  
VickiB IA : really is and to know that kids like them live all over the world.  
VickiB IA : Per school or for whole state?  
VickiB IA : That is not bad for the whole state,  
Phil : Whole state. I dont't know if that's a one-time charge or a annual fee.  
VickiB IA : I see the benifits for students being worth it more than for staff.  
Phil : As regards this interview, do "typos" bother you when using computer conferencing?  
VickiB IA : Only mine.  
Phil : I know that feeling!!  
Phil : Do you find the time delay between responses annoying or objectionable?  
VickiB IA : Yes, a little bit annoying.  
VickiB IA : Yes, a little bit annoying.

Phil : Enough so that it seriously detracts from the overall conference?

VickiB IA : My screen froze, not that annoying.

VickiB IA : No

Phil : jgood.

Phil : (or just good)

Phil : Are you paying long distance charges now for this interview?

VickiB IA : No, Mary is!!!

Phil : Oh, well thats fine then!!!!

VickiB IA : Not really, I will feel obligated to make it up to her somehow.

Phil : I hope she knows that Kirk said to submit the bills to him just like the others and he'd pay her.

VickiB IA : Oh great!

Phil : The on-line charges and the telephone charges will be covered. She should probable contact him on-

Phil : line for specifics.

VickiB IA : Mary thought maybe she spent too much already.

Phil : This is in addition to the regular project charges.

VickiB IA : OK

Phil : Vicki, you mentioned you are working on your masters. How's it coming?

VickiB IA : I'm done except for revisions on paper.

Phil : Fantastic!

Phil : That's a good feeling, isn't it.

VickiB IA : Yes.

Phil : One more question: how do you feel about this form of interview compared to a face-to-face interview?

VickiB IA : I'm a face to face person.

VickiB IA : But it does save time and travel.

Phil : That's for sure.

Phil : I do have your pictures, so at least I know what each of you look like. Do you think that's an

Phil : advantage?

VickiB IA : Well, except for my fat face!

VickiB IA : I would like to know what you ;look like.

Phil : Mine too!

VickiB IA : When do you get your doctorate?

Phil : As soon as I'm done with my dissertation.

VickiB IA : Hope this helps. How many interviews will you do?

Phil : Vicki, thank you very very much for your time on this. It's been really interesting and helpful

Phil : for me to be able to do this with the two of you.

VickiB IA : You are welcome.

Phil : I'm hoping to get 12 interviews done altogether.

VickiB IA : Good luck.

Phil : Say goodbye to Mary for me, please. Bye.

VickiB IA : Bye from both of us.

6/18/93 12:21:07 PM Closing Log file.



APPENDIX C

INTERVIEW QUESTIONS

## Carver III - AOL Project

## Interview Questions

1. What kinds of computer experience did you bring to the project?
2. Are there any particular experiences within the project that make you more comfortable with computer conferencing? (What?)
3. Have you gained any related experience outside of the project which enhances your computer conferencing expertise? (What?)  
Do you use AOL for non-project related things (browsing, email, etc.?) (What?)
4. Have you experienced any technical problems while using your computer, modem, and AOL?
5. As regards the amount of time which you devote to using AOL:
  - A. do you spend more, less, or about the same amount of time now as when you first started the project?
  - B. does using AOL allow you to accomplish any more "work" than before you began using it? (What do you mean by "more"?) (What kind of work?)
  - C. are time constraints more of a personal factor or a school (curricular) factor?
  - D. did AOL just "add in" to your school schedule, or did you have to replace something else? (What did you replace?)
  - E. do you use the computer every day? Do you use AOL

every day? About how much time do you spend using AOL each day that you do use it?

6. Are there many other "computer using" teachers or administrators in your building?  
Have you shared your AOL experience with them?
7. Some of the project participants have someone else in the same building who is also participating. Do you see this as an advantage, a disadvantage, or of no consequence?
8. Does your school district have a full-time computer (technology) coordinator? Part time? Do you think they should?
9. Does your school provide any staff-development activities relating to computer use? Have you helped provide any such activity?
10. Does your school district support computer use for learning goals only or for any school-related use, such as email, newspaper publishing, yearbook, etc.?
11. Are teachers allowed to take computers home from school?
12. Do you see any personal or professional advantages to using AOL?
13. Do you see AOL or other such services as a viable delivery system for staff development?
14. Would you continue to use AOL if you had to pay the charges yourself?
15. Are you aware of other on-line services which are available?

16. Does the lack of face-to-face interaction affect your use of AOL?
17. Did the fact that the Carver III project is in the forefront of the emerging field of computer mediated communication influence your decision to participate in the project?
18. Was this project relevant and useful to your teaching?
19. Do you think that on-line activities are going to be a long-term or a short-term phenomenon?
20. How much reading do you do?  
How much of your reading is connected to your teaching job?  
What types of work-related materials do you read?
21. Do you enjoy writing?  
How much writing do you do?  
Is the writing you do mostly job related?  
If not job related, what does motivate you to write?

APPENDIX D

SOCIAL ASPECTS OF CONFERENCES

## Conference 1

Fac2:Mr. Furino...  
Fac2:good to see you.  
Fac1:Avast, ye buccos!  
Fac3:what about bob?  
Fac4:Hey, Bob 2!  
Fac4:Yuk, yuk.  
Fac2:I don't know....WHAT about Bob?  
Fac2:Enquiring minds....  
Fac2:Lori....  
Fac2:hello  
Fac1:He's here. Mind is engaged! What a concept!  
Fac4:Hi Lori! Glad to see you made it.  
Fac2:Did everyone get the instructions on hiliting?  
Lori:GREETINGS!  
Fac3:welcome Lori  
Fac2:Clark! Mr. Best Dressed!  
Fac2:How are you?  
Fac3:Ted - hello  
Ted: GOOD TO BE HERE  
Fac1:Good to see you, everyone.  
Fac3:the room is fillin up  
Fac2:Unlock the caps Ted...it means screaming online!  
Fac3:Hi Enid  
Fac2:my ears are rining. lol  
Fac2:ringing....duh!  
Fac1:I think we will have a full house from all  
indications.  
Fac2:Sharon...UNI Fight!  
Patrick: What is rining?  
Fac3:Hi Sharon  
Fac2:How many of you have 2 teachers at the computer?  
Fac5:You betcha!  
Ted: I don't want to scream, sorry  
Georgine: Hi, everybody  
Fac3:Yeah - Kathleen  
Fac1:Hi, Rick! Did you get the problems solved on the  
Mac?  
Fac2:ahh....much better.  
Fac2>Welcome Kathleen.  
Fac2:What a room full of talent!  
Kathleen: HI EVERYBODY!  
Fac4:Marge made it (at home)  
Fac3:Daniel - Hi!  
FacRoger: Hi all, hope to see you at the parade on Sat  
Fac2:You guys have been terrific in getting things done.  
Fac2:your journals, student notes, e-mail...thanks for  
your hard work.  
Georgine: It has really been a rush trying to do it all.  
Kathleen: What's Saturday's parade?

Fac2:Helen! Welcome! Is Mar with you?  
Fac1:My kids have been EXCITED about all the information piling up in their direction!!  
Patrick: No! I have to take everything off the MAC to get the printer to do its screen thing! I sent mail!  
Fac2:UNI homecoming.  
Fac3:Hi to Tripoli  
Roger: Fac1 We have a GTV question when finished.  
Daniel: Keith and Daniel are here.  
Fac2:Hi Angela. Welcome!  
Helen: Yes, Mary is here too!!  
Kathleen: thanks Marsha  
Fac3:Hi to Angela  
Fac2:Shall we get started?  
Angela: Sylvia and Angela are here in spite of technical difficulties.  
Fac1:Bob, I will stick around a bit afterwards and we can take care of the GTV question. No problem.  
Fac2: Has everyone been able to follow the directions in hiliting?  
Fac4:Good idea  
Patrick: I got to miss the UNI homecoming! Got to teach a sex clinic to middle school kids!  
Fac2: It will make this conference much easier to follow.  
Georgine: Yes, I have you highlighted, Marsha.  
Fac2: If you are on a Mac...click on the people button in the upper left corner  
Roger: we have you hilited  
Fac1:GS people, did you get your note on hilighting? Any problems?  
Kathleen: What do you mean---highlighted?  
Fac2: then hilite my name in blue...and click hilite on the right side of the screen.  
Kathleen: My monitor is in b w  
Fac2:This will allow you to see the hosts (moi) typing in bold face.  
Georgine: It is so much easier on the Mac.  
Fac1:Blue is grey in B&W  
Fac2:You should still be able to do it.  
Fac2:Try it Kathleen.  
Fac2: thanks Bob.  
Fac2: Welcome Bonita!  
Angela: Fac1 - Did you get my message about the address book for the IIgs?  
Fac2: I will begin an open ended sentence. I would like you all to fill in the blanks.  
Mindy: Thanks! Terri is also here.  
Fac1:GS people, you have to use the Apple-T to get your menu bar, then click "People" on the far right

**Fac2:** READY?  
 Daniel: Bob, will you go through the steps to download  
 from the student to student text?  
**Fac2:** Hi Terri.  
**Fac1:** of your menu bar. That will give you the  
 highlighting option. Then press Apple-T again  
**Fac1:** to get back to the chat screen.  
**Fac2:** EVERYONE READY...say "AYE"  
 Helen: aye  
 Angela: ayew  
 Roger: aye!  
 Georgine: Aye  
**Fac5:** "AYE"  
 Ted: AYE  
 Daniel: aye  
 Jodi: Jodi IS HERE. I HOPE YOU CAN READ ME.  
**Fac3:** aye  
 Angela: Linda can't spell!  
 Lori: aye!!  
**Fac1:** Yes, Angela. One doesn't exist on the GS. Even  
 worse, cut and paste can't be used to fake it.  
 Tracey: Aye  
**Fac4:** aye  
**Fac2:** The "Aye's" have it...LET'S GO!  
**Fac1:** You just have to type in all the names....Ugh!  
 Daniel: Keith is here.  
**Fac2:** The best thing about AOL so far is.....  
**Fac1:** Yes, Daniel. We can go through the steps. How far  
 do you get when you are trying to download?  
 Kathleen: I am a bit slow and missed something oh well  
 I have you all hilited!!!  
 Helen: still confusing  
**Fac4:** reading all of the great journals.  
 Georgine: enthusiasm  
 Roger: We were just happy to finally get on.  
 Mindy: Aye  
 Kathleen: Thanks TyAnn  
**Fac1:** Aye  
 Lori: The football odds and the fact that my students  
 like it  
 Dawn: Hi from Dawn and Ericka  
 Jodi: THE INFORMATION WE CAN CALL UP.  
 Angela: Making my mind work overtime trying to figure  
 this all out!  
 Patrick: aye  
 Angela: Jodi - How is your foot?  
 Kathleen: So much to find out!  
**Fac2:** To repeat...the question is....The best thing  
 about AOL is....  
 Daniel: bob, we do not get very far as we can not get  
 the down load button to come on the screen.



Ted: showing students a variety of possibilities and sensing their excitement.

Patrick: Get the boss interested in technology!

Helen: best??? still having trouble finding the right places to go and time to do it

Daniel: Bob, some file give us the download button, such as the encyclopedia file.

Kathleen: Kids are so excited!

Jodi:Bob, I am needing help downloading to make my newspaper. Can you help me?

Fac2: OK>>>> the rules of the game....

Tracey: the reaction of the kids and the parents!

Helen: the kids ask what is it and it's hare to explain

Jodi:Angela, Thanks for asking. I'm in a shoe and doing well>

Fac2: To make this an easy conference to follow, we need to follow some guidelines.

Fac2: Hold all questions until the end.

Daniel: The best thing about AOL is that it is hands-on for the students.

Fac2: The typing that will go on now will be limited to the answers to the questions.

Fac2: I think it will make it easier for all.

Fac2: And that's what we are here for...

Fac2: if you have an immediate problem, IM one of the lead teachers.

Fac2: OK folks?

## Conference 2

Terri: Hi, Sharon, How's it going?

Fac5: goin' great....if I had about 24 more hours in a day!!!

Fac5: how's it goin' for you?

Terri: O.K. After 6 inches of snow yesterday, I thought my chances of a day off were good. I have so many

Terri: things to do to get ready for the holidays.

Fac5: some people!!! Boy i remember staying up late and getting up early just to watch the school closings!1 Now, here we don't close for anything

Terri: I have all the candy and cookie fixins' at home if the weather decides to dump another load of snow.

Fac5: hi Patrick! How is it going for you?

Patrick: You don't understand! to get a day off the snow should start about 3:30- 4:00 AM. This way the plows

Terri: I was talking to my brother in Minneapolis last night, He wondered about the Ave. of the Saints.

Patrick: don't have a chance to get out!

Terri: Do you know of any progress?

Fac5: We've got signs up for "the saints! Is that progress?

Patrick: The ave of the STs. will begin construction this summer or the following summer. That is how I understand it.

Patrick: understand it.

Terri: Will it go to Mason City to pick up I 35?

Fac5: That's the plan so far.

Terri: Thanks! Has anyone heard whether TyAnn has delivered her baby?

Patrick: I was 'hoping it would pass through the Quad-cities, but Iowa City isn't so far to go to pick it up

Patrick: Yes, Tyann had a boy!

Fac5: Yep, she did - Geoffery Donald something

Terri: Great! I assume mother and child are doing well.

Fac5: Haven't heard otherwise

Patrick: We received an E-mail note about it and an address for snail mail if we desire to send cards.

Terri: Somehow I lost my mail today. I thought I'd saved it to my files, but when I went to read it, it was gone.

Terri: gone.

Fac5: Hi, Sylvia... How's things?

Terri: Hi, Sylvia.

Sylvia: Hi, Things are fine here. Angela will be joining in a few minutes. She will be able to stay only 15 minutes or so. Good to talk to you all again.

Sylvia: minutes or so. Good to talk to you all again.

Patrick: This is really a busy time of the year. Does everyone feel as rushed as I do to get things done?

Terri: YESYESYESYESYESYESYESYES

Sylvia: Will we have many people here today as usual??? What about TyAnn?

Fac5: Gee Terri, it wasn't clear what you meant. Are you feeling really busy?

Sylvia: For me, things have settled down a bit. November was just crazy for me at the schools, and then I had jury duty on top of all that!!!

Sylvia: jury duty on top of all that!!!

Patrick: What about TyAnn, I guess Geoffrey will have a lot to say as to whether or not she's here today!

Fac5: Oh!!! The fates were not kind to you,  
 Sylvia!!!  
 Terri: I'm on a social studies curric. writing  
 committee and lost a day to it yesterday.  
 Cooperative  
 Terri: learning on 5 Saturdays makes for long weeks.  
 This Sat. is the last.  
 Patrick: Terri, you are busy!!  
 Sylvia: OOH!! Saturdays before Christmas??? That is  
 toooo much dedication!!  
 Tracey: Do you believe I almost forgot how to get  
 here!!??  
 Fac5: Hi, Tracey.  
 Tracey: Hi everyone:)  
 Patrick: I get to participate in a new textbook  
 adoption committee in the near future. Doesn't  
 the sound like f  
 Patrick: like fun. It willbe interesting but time  
 consuming.  
 Fac4: Greetings from the nursery!  
 Terri: We're writing a curric. for the first time.  
 Does your district have a SS. curric. written,  
 Patrick?  
 Tracey: Congratulations, TyAnn!!  
 Sylvia: Ty Ann - How are you feeling???  
 Congratulations!!!  
 Fac5: Hey!!!! Hi, TyAnn!!! How are you doin', & how  
 about filling us in?!?!?  
 Patrick: Fac4, Geoffery must be asleep!  
 Terri: Congratulations, TyAnn!  
 Fac4: Thanks, all  
 Fac4: He is for the time being. :)  
 Fac5: Hi, Marsha  
 Patrick: Congratulations, Ty Ann  
 Fac2: Hi all!  
 Terri: Best Wishes, Marsha!  
 Tracey: Congratulations to you, too, Marsha!  
 Fac5: Hi, Marion:)  
 Marcia: Congratulations , Marsha  
 Sylvia: Are you still Marsha G.??  
 Marcia: Hello all!  
 Terri: Mindy is here, too  
 Patrick: Belated Congrats to you also Marsha. I wanted  
 to send you a little ditty but never got  
 around to it!  
 Georgine: Hello, everybody.  
 Fac5: Hi, Georgine :)  
 Fac1: Hi, Folks. Ready to roll?  
 Fac5: Hi, Jodi & Bob  
 Jodi: Hi all, what's been said that I have missed?  
 Marcia: Christine is here with me

Fac2: Thanks everyone.  
 Fac2: Yep....at least in the land of AOL! But...it's better than MarshaGoo! lol  
 Fac1: We are all rolling in, and we have quite a bit to cover. Let's all highlight the host, me.  
 Fac5: Hi, Lori :-)  
 Sylvia: Hi, Lori - this is Sylvia. I will be in DM this weekend to see "Annie" at the Civic Center.  
 Patrick: Hi Bob  
 Fac1: Does everyone have the host (Fac1) highlighted?  
 Marcia: yes  
 Sylvia: yes  
 Fac4: yup  
 Fac2: I do!  
 Dawn: Hello everyone!  
 Fac5: yep  
 Lori: Neat Sylvia - I hear its a great show  
 Jodi: yes  
 Lori: yes  
 James: Hello from (James) and (Roger).  
 Fac1: It sounds like we are ready. Let's do a roll call. Introduce yourselves by typing in the name of  
 Fac1: each of you who are online today.  
 Kathleen: Hi Everyone from (town)  
 Jodi: (Jodi) from (town)  
 Fac2: (Fac 2) present. :)  
 Dawn: (Dawn) & (Ericka)  
 Fac2: whoops! Henck.  
 Terri: and (Terri): from West Middle School in (town)  
 Kathleen: (Kathleen)  
 Patrick: (Patrick)  
 Sylvia: (Sylvia) and (Angela) from (town)  
 Tracey: (Tracey) from (town):)  
 Marcia: Congratulations Ty Ann  
 Fac5: Fac5  
 Marcia: (Marcia) and (Christine)  
 Wayne: (Wayne) , (town)  
 James: James and (Roger) IA  
 Lori: (Lori)  
 Jane: Hi from (town). This is (Jane) and (Helen)  
 Fac4: (Fac 4) and Geoffrey from the nursery - although he is currently asleep.  
 Georgine: (Georgine) from East Buchanan at (town).  
 Jane: How's the new mom?  
 Kathleen: Hi TyAnn!!!! I am anxious to see both of you!

**Fac1:** I assume that is all of us. I want to introduce the first subject. First, I want to publicly  
 Jodi: Glad Marsha and Ty Ann are both with us. Congratulations to you both.  
**Fac1:** congratulate Marsha and TyAnn for the major changes in their lives.  
 Wayne: Hopefully for the better....  
 Georgine: Ditto!  
 Kathleen: !!  
 Lori: Hear! Hear!  
 James: !!  
**Fac1:** It's great that both of you are able to be here for the conference. Great scheduling you two!  
 Patrick: Who's hosting this show, Bob or Rush?  
**Fac1:** Any words from Marsha and TyAnn?  
 Fac2: Thank you dear friends.  
 Fac4: Just thanks and on with the show!  
 Lori: Before Geoffrey wakes up

### Conference 3

**Fac5:** Hi Mindy, How are you doing  
 Mindy: Hi Sharon, Terri can't make it but I have her answers to your questions.  
**Fac5:** Great, I mean, sorry about Terri not making it, but great that she's forwarded her answers!  
 Mindy: What is the agenda? Do you want our input on your questions? I can't stay the entire time; I have an  
 Mindy: -other meeting.  
**Fac5:** The idea is to have people prepared with ideas, but, I am hoping that we get more dialog  
**Fac5:** The other aspect is if you want to send your rponses as mail, .that's ok too, I understand abou  
**Fac5:** the two meetings in one hour thing....  
**Fac5:** If no one else shows up might be u n me  
 Mindy: One neat honor for a student at our school is his winning the State National Geography Bee. He goes  
**Fac2:** oohh...do I get a worm? (for being early?)  
**Fac3:** Yo - happy day  
 Mindy: to Washington, DC to represent Iowa at the end of May.  
**Fac5:** Great! It's things like that that make teaching very rewarreding

Fac2: represent Iowa? I know I missed the beginning of this....tell me more Bonita.

Fac5: And, no marsha, we get the worm...you're not the first one here!!!

Fac2: Hi Patty and Sharon! :)

Fac5: Hi Marsha and Patty and Brent

Mindy: Marsha, have you got the envelope of Muscatine info I sent you?

Fac3: Hi ya babe

James: Hi from James and Roger

Fac2: Bonita...it came today. Thank you so much.

Fac7: Hello, all!

Fac5: Ive heard from a couple of folks they can't make it, how many people are expected?

Fac3: HI James & 5

Fac5: Oh, Hi to Kirk and Bob, too

Fac7: Hello, Sharon!

Fac3: Hi to Kirk!

Fac2: Kirk...hello. :)

Mindy: Marsha, to answer your question: one of our seventh graders won the State National Geography Bee.

Fac5: Hi Lori

Fac2: Wow! That's terrific Bonita. Congrats to him/her and to you.

Fac3: Wow - Mindy that is GREAT!

James: Good job Mindy!

Fac5: Hi Kathleen

Kathleen: TyAnn has had "one of those days"! She will come down and join in with me when she is able.

Mindy: I'd like to take credit (I did comment that we talked much about world geography in 6th science)

Fac5: I can appreciate that feeling...nearly everyday gets like that!!!

Fac3: Lori - how are you? When is the DAY?

Mindy: The TAG teacher will accompany him to Wash, DC.

Lori: Supposedly June 6th...but I think earlier!

Fac1: Hi, folks.

James: Hi Bob

Fac5: I would like to give everyone about one more minute to get here....by the way I get to be the "host"

Fac5: today....so I'm the one to "BOLD"

Fac3: You will have an exciting summer, Amy

Fac1: Hi, host.

Fac3: HI Bob!

Fac5: Hi Bob.

Fac2: Bobbers....the Bobster...hiya!

Lori: Hoo boy don't I know it.... a 4 year old and a newborn! EEEEEK!

Fac5: Ok, kids, let's get started....

Fac5: I would like to introduce you to a doctoral student, Phil Hibbard

Fac7: Ready...\

Fac5: He's joining us today because he is very intersted in AOL and teachers using the system

Georgine: Hi, everybody. I made it!

Erica: Hello Phil from Muscatine.

Fac5: So, to begin....how about talking a little about time....

James: Hi Phil. Welcome.

Fac2: Yeah...Enid!

Christine: I everyone. Marcia and Christine here

Fac5: Remember I asked the question of why have comments aobut time "dropped out".....

Fac3: Glad you could make it Georgine

APPENDIX E

ANALYSIS OF READABILITY



The focus of this study did not include the application of inferential statistical analysis. However, an examination of Figure 3 (p. 60) did evoke a question of significance regarding the paired means.

A t-test for Paired Samples was performed on the Rix Index of journal and conference postings. The results demonstrate that there is a statistically significant difference between the means [ $t(19) = 4.47, p < .001$ ].