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AUTHOR Johnston, Valerie L.
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ABSTRACT

This paper is an introduction to computer-mediated communication (CMC) for university faculty and uses of CMC in education and professional development. An introductory section defines CMC, describes CMC tools, and briefly reviews the literature. The following topics related to CMC in instruction are addressed in the first section: educational uses of CMC; advantages and disadvantages; usage guidelines, including the electronic moderator, design issues, and electronic messages; and CMC in the classroom. The next section discusses CMC in professional development and research; and the third section describes CMC at the University of Alaska, Anchorage (UAA), including electronic mail, computer conferencing, and computer networks. Recommended resources and 50 references are listed. Appendix A contains a study by the author done in April 1992, entitled "Faculty Use of Computer-Mediated Communication at the University of Alaska Anchorage." This research report describes a questionnaire sent to faculty via electronic mail to determine how often and for what purposes faculty members utilize CMC. Results indicate a low level of CMC usage reported, particularly in the area of instruction, with many faculty indicating a desire to have more information and training on CMC. The questionnaire and questionnaire results are appended; and a list of 25 references is included. (ALF)

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# Towards a Global Classroom:

## Using Computer-Mediated Communications at UAA

Valerie L. Johnston
University of Alaska Anchorage
Vocational Teacher Education Research Project
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As a teacher imagine the following:

A course in which your students take part in discussions both in and outside of class. In these discussions, the normally quiet or shy students participate as much as the outspoken students. No one interrupts. Each person has as much time as they need to contribute to the discussion. They are able to take part in the discussions at 1 p.m. or 1 a.m., whenever it is most convenient for them. They can participate from the comfort of their own home or dorm room.

You meet a colleague from another country. You discuss ideas, and write a paper together without ever meeting face-to-face, making a long distance phone call, or sending materials through the postal service.

Students ask you questions without calling on the phone, visiting during office hours, scheduling an appointment or meeting face-to-face. You answer the questions when it is convenient for you and can reply to similar questions from several students all at once rather than having to repeat it over to each student.

A course in which you have a different guest speaker every week. Your speakers are from all over the world. Each is an expert in their field and your students are able to carry on a course related discussion with them that week. No travel, audio or video conferencing costs are involved; the speaker may not even have to leave home.

Keeping up-to-date by participating in discussions with your colleagues that involve the latest events and ideas in your field. The time of day or night or whether you are at home or in the office makes no difference in your participation.

Sound interesting? Maybe even unlikely or impossible? Not at all. All these scenarios and many like them are within your power to make happen at the University of Alaska Anchorage. The key to making this happen is already available - computer-mediated communications.

## Introduction

> *"The computer thus becomes a vehicle for human communication and for the creation of networks of help, information and communal research as opposed to a preprogrammed resource."* (Kaye, Mason, & Harasim, 1989, p. 3)

As our world moves towards a "global village," communication becomes the bridge that brings us together. Communication is fundamental to our understanding of one another and to working out solutions to common problems. Today the computer is part of this global communications process.

Communication also plays a vital role in the educational process. Traditional methods of communication accepted in education are oral, written, visual, and audio-visual. A communication system now gaining acceptance in education is computer-mediated communication (CMC). This paper is an introduction to computer-mediated communications for university faculty and its uses in education and professional development.

### CMC Defined

> *"This [CMC] would seem to encompass any system where the computer is used to mediate communications between and amoung humans as individuals or as groups."* (Turoff, 1989, p. 108)

Computer-mediated communication is the use of the computer to facilitate information exchange between people. There are many characteristics that help delineate this new communications medium (Grabowski & Pusch, 1990; Harasim, 1987; Goode & Johnson, 1991). They include:

- asynocronicity (time independence)
- space/distance independence
- hybrid of formal and informal writing which includes the flexibility and spontaneity of spoken conversation
- permanent (written) record of conversations
- lack of visual and audio signals from the communication sender
- emphasis on content rather than sender
- potential for group learning and collaboration

### CMC Tools

> *"Computer-mediated communication is the set of possibilities which exist when computers and telecommunications networks are used as tools in the communication process: to compose, store, deliver and process communication."* (Mason, 1990, p. 221)

The communication tools in CMC are computer programs through which text is composed, saved, sent, received, and reviewed. The tools used in computer-

mediated communication include electronic mail, computer conferencing, electronic discussion groups, on-line information databases, computer bulletin boards, and computer file archives. All of these tools are available to the faculty and students at the University of Alaska Anchorage through the VAX computer system.

Electronic mail (e-mail) is a computer-based method of one-to-one or one-to-many communication. Using electronic mail, a person can compose and send messages to other people on a computer system or over a network of computer systems. Electronic mail can be thought of as an electronic version of the U.S. Postal Service for delivery of written materials.

Computer conferencing, a computer-based mode of many-to-many or group communication, does not directly compare to any other communication medium. It is an ongoing interactive discussion between people. Messages on specific topics are posted to common areas that are read and added to by others.

Electronic discussion groups allow people to communicate thoughts, comments, or make inquires on specific topics. People contribute to a current discussion or start a new one within the topic area. Electronic discussion groups can be conducted using electronic mail or computer conferencing.

An on-line information database is an electronic database on a given subject area. Databases are storehouses of information that allow for easy retrieval of information. ERIC and ProQuest are examples of databases in the UAA Library. GNOSIS is an example of an on-line information database that contains library card catalog information for the University of Alaska. On-line information databases can be accessed from your home or office computer.

Computer bulletin boards are similar in concept to the standard bulletin board. There are areas for posting messages between board users and notices for others to see. Unlike standard bulletin boards, on electronic boards people can post long documents and files for others to access and use. Depending upon the system, you may be able to access information databases, electronic mail, or receive files. Most bulletin board systems are menu driven and easy to use.

File archives are a popular computer application. The type of files vary from computer system to computer system. Some archives keep personal computer program files such as foreign language tutorials and games, while others keep professional information files such as research and position papers. Do not be mislead - the computer programs available are not the commercial versions sold in stores, but shareware, freeware, and public domain.

Electronic discussion groups, on-line information databases, computer bulletin boards, computer file archives are all available via the BITNET and Internet networks. BITNET, the Because It's Time NETwork, is a national network of research and educational institutions. It is an electronic mail-based network that utilizes discussion groups and file archives as well as electronic mail. The Internet is a national network that links educational, research, and military networks together. Like BITNET, on the Internet there is electronic mail, discussion groups and file archives, but in addition, there are on-line information databases, computer bulletin boards, and access to other computer systems.

BITNET and Internet both tie into other international networks. Access to either of these networks opens gateways to other countries. It is this component of CMC that brings it the global perspective. Through these networks at UAA we have gateways to the rest of the world.

### Review of the Literature

Computer-mediated communication is not a new technology. The electronic mail and computer conferencing components of computer-mediated communication have existed since the 1970's (Brookshire, 1991; Turoff, 1989). Since that time many aspects of computer-mediated communication have been researched (Brookshire, 1991).

The research on computer-mediated communication has included the areas of evaluating the technology (Hiltz & Johnson, 1989; Lorentsen, 1989; Mason, 1989), comparisons to other communications media (Stix, 1986; Turoff, 1989), social and psychological factors (Boshier, 1990; Somekh, 1989), use in distance education (Davie, 1988; Kaye, 1989; Paulsen, 1991), educational applications (Graddol, 1989; Harasim, 1986; McCreary & Van Duren, 1987) and professional development (Hiltz & Turoff, 1985; Pullinger, 1986; Spitzer, 1991).

In addition to the research, there are many examples, tips, and guidelines for using computer-mediated communication in an educational setting (Brochet, 1986; Hiltz, 1986; Kerr, 1986; Mason, 1991; Phillips, Santors, & Kerehn, 1988). Computer-mediated communication is used throughout the United States and the world for educational purposes (Davie, 1987; Hunter, 1990; Phillips, Santors & Kerehn, 1988; McCreary & Van Duren, 1987).

## CMC in Instruction

> *"For some teachers, telecommunications expands the horizons of their classroom, opening the doors to real audiences and exciting interactive activities from locations around the country and the world."* (Rogers, Andres, & Jacks, 1991, p. 25)

By using computer-mediated communication a teacher can expand the classroom beyond its traditional boundaries. Like any other tool in education, computer-mediated communication does not solve problems without proper planning and use. Rogers, Andres & Jacks (1991) comment about CMC, "Like many aspects of successful teaching, we have found that planning is the key to success" (p. 26). Other keys to successful planning and utilization of CMC in instruction include understanding appropriate uses of the technology, advantages and disadvantages of use, and usage guidelines.

## Educational Uses

> *"It is a new learning domain which enables us as educators and as learners to engage in learning interactions more easily, more often and perhaps more effectively, but also to develop qualitatively new and different forms of education interactions."* (Harasim, 1989, p. 62)

When is it appropriate to use computer-mediated communications in education? CMC can supplement most courses regardless of the topic. Courses in the humanities, education, english, fine arts, social sciences, and even math and natural sciences can utilize computer-mediated communication. For many courses it can be the main communication medium. The best applications for CMC is any course which involves collaborative or group learning, distance education, or collaborative and basic research (Harasim, 1989; Kamper, 1991; Kearsley & Lynch, 1991; Mason, 1989).

One of the main tools of CMC, computer conferencing, is a form of group communication. As such, it is an excellent medium for collaborative educational and professional activities. Communication over the computer help equalize differences between individuals in a group whether the differences are gender, physical or speech based (Goode & Johnson, 1991; Harasim, 1987).

Computer-mediated communication offers a new delivery medium for use in distance education. Once considered only "correspondence" study, distance education is now a multimedia effort. However, the bulk of communications in distance education is still one-to-one. CMC offers unique opportunities for group distance education without the time and space limitations of audio and video conferencing.

## Advantages and Disadvantages

> *"It is wrong to try to compare it [CMC] and pigeonhole it as some combination of existing forms. It produces very different behavioral and social patterns for the groups and organizations that make effective use of it."* (Turoff, 1989, p. 119)

The research into educational applications of computer-mediated communication has included examining the advantages and disadvantages (Harasim, 1987; Mason, 1990; Tooey & Wester, 1989). Many faculty have found that the rewards or advantages of using CMC outweigh the challenges (Cheng, Lehman, Armstrong, 1991; Harasim, 1987; Mason, 1990; Turoff, 1989).

The most commonly mentioned advantage with computer-mediated communication in the classroom is the freedom from time and distance constraints (Grabowski & Pusch, 1990; Kamper, 1991; Mason, 1990; Norton & Stammen, 1990; Tooey & Wester, 1989). Many university computer centers have some form of 24 hour computer access. The student (and the faculty member) can work at the time most convenient to them, whether it is 2 a.m. or 2 p.m. Through the use of

the phone, the computer and modems, distance barriers are removed. A person does not have to be on campus to access the computer. They only need access to a personal computer with a modem and a phone line.

Many teachers found with computer-mediated communication that the levels of teacher-student and student-student interactions are higher than in most traditional classroom settings (Boshier, 1990; Davie, 1987; Grabowski & Pusch, 1990; Kearsley & Lynch, 1991). This increased level of interaction is often desired in many graduate classroom settings. The increased interactions can occur in less time than in face-to-face conversations (Tooey & Wester, 1989).

There are other instructional advantages to using computer-mediated communication. It often forces students to develop better reflective writing skills (Davie, 1987; Mason, 1990). Students have more time available to compose their messages and emphasis is more on content than the person's status, gender, or physical appearance (Grabowski & Pusch, 1990; Harasim, 1987). There is no competition for "air space," everyone can contribute equally and have as much time as they need to make their points. Being a written medium, there is a permanent record of the class transactions available for both student and teacher to review.

Computer-mediated communication can include lower communication costs for distance education (Phelps, Wells, Ashworth, & Hahn, 1990; Kaye, 1987). Usually, the costs of communicating over a computer modem is lower than using audio or video conferencing. Sometimes it is even cheaper than the postal service. Like audio and video conferencing, computer-mediated communication can link people in remote locations. In Alaska many remote locations can access the University's computer system without the cost of a long-distance phone call through Alascom's Alaskanet and the University of Alaska Computer Network.

Common problems with using CMC involve technology barriers (Davie, 1987; Grabowski & Pusch, 1990; Mason, 1988b; Riedl, 1989; Tooey & Wester, 1989). Before even considering the use of CMC in instruction, there must be adequate access to the technology. Computers must be available to both students and faculty members. Ideally, this includes computer access from the homes of students and faculty. Even with sufficient access to the technology, there is the task of learning to use the technology. Not all students will be familiar with computers or the CMC programs. There must be abundant support to help overcome difficulties experienced with learning to operate the computer equipment and programs (Davie, 1987; Grint, 1989; Turoff, 1989).

Integrating computer-mediated communication into the traditional classroom can be challenging. The trap of using the technology for technology's sake must be avoided. For maximum effectiveness, computer-mediated communication should be woven into the course and not considered independent of it (Harasim, 1987; Mason, 1990). This integration into the course may involve an increase in planning time.

For students using CMC, difficulties are experienced in using and getting adjusted to the different communication medium. There is a lack of verbal and

visual cues in CMC (Boshier, 1990; Grabowski & Pusch, 1990; Harasim, 1987). For some, this lack of cues is unnerving and can cause difficulties in communicating. One phenomenon that is seen is called "flaming." A sender's message is either opposed or misinturperted by another and an argument or personal attack against the sender occurs. Flaming can be intimidating to the unsuspecting recipient. Careful moderation of class discussions can defuse and minimize flaming (Goode & Johnson, 1991; Tooey & Wester, 1989).

Information overload is another problem that CMC participants experience (Grint, 1989; Harasim, 1987; Hiltz & Turoff, 1985). For new students, following multiple discussions on a particular topic is difficult until new information skills are learned. Careful structuring of the course requirements can help to minimize overload as well.

## Usage Guidelines

*"CMC is a tool for people to use."* (Somekh, 1989, p. 242)

By following some basic guidelines, many of the disadvantages of CMC can be minimized or eliminated and the potential of the advantages maximized. These guidelines can be grouped into areas of: being an electronic moderator, designing CMC instruction, and sending computer-mediated messages.

### The electronic moderator

*"At an educational level, the moderator guides the discussion, stimulates participation, and often offers intellectual leadership."* (Mason, 1991)

Effective leadership is one key to successful implementation of computer-mediated communication in a course. The role of electronic moderator is like any other educational moderator. The moderator (Christensen, 1990; Kerr, 1986; Mason, 1991; Spitzer, 1991):

- sets the agenda,
- decides objectives, time tables and procedural rules,
- lets students know expectations, requirements of the course, activities, and schedules,
- manages class interactions by focusing discussions, asking questions, probing responses, defusing destructive conflicts, and weaving concepts together,
- encourages participation and provides feedback,
- creates a friendly, social environment, and
- is flexible.

In addition to these tasks, the moderator of a computer-mediated communication course also provides technical support (Smith, 1991; Spitzer, 1991).

This does not mean that the moderator must be a technical expert, but should be familiar with the software. The moderator should know some basic troubleshooting techniques or troubleshooting resources such as the computer center support group.

### Design

> *"Computer-mediated discussion does provide a degree of depth and diversity that is usually not available in the traditional classroom."* (Riedl, 1989, p. 219)

Many traditional instructional designs work in a computer-mediated course. Designs that have worked for other teachers (Harasim, 1989; Mason, 1988a; Spitzer, 1991) include seminar, small group discussions, learning partnerships, small working groups, team presentation, simulations/role playing, debating teams, peer learning groups, and informal socializing.

The more effective designs utilize the strengths of the medium (Harasim, 1990; McCreary & Van Duren, 1987). When designing on-line education, Harasim (1990) contends that the instructor should take the attributes that delineate CMC into account. These CMC attributes include many-to-many communications, place and time independence, text-based, and computer-mediated interaction.

These attributes of CMC also define appropriate uses of the technology that must be considered in designing instruction. Many-to-many communication encourages collaborative learning and research. Place and time independence are characteristics of distance education. The text-based nature of the medium is well suited for written assignments. Finally, the computer-mediated interactions help to minimize differences between people.

### Electronic messages

> *"It encourages groups of people to interact, and facilitates access to colleagues that one might never have met in a lifetime of employment on a busy, urban campus."* (Tooey & Wester, 1989, p. 60).

The world of computer-mediated communication is a unique society with its own rules of etiquette (Goode & Johnson, 1991). Things to remember when sending messages include (Goode & Johnson, 1991; Hiltz & Turoff, 1985; Quarterman, 1990; Rapaport, 1991):

- Limit each message to one subject per message.
- Use subject headings in messages.
- Keep your message succinct.
- If replying to a previous message, include enough of the original message to make the context of the reply clear.
- When sending a message to a forum indicate if you prefer private or public reply.

- Respond promptly to electronic mail messages from others.
- Proofread your messages before sending.
- Label messages that are humorous, sarcastic, or emotional.
- ALL CAPS is SHOUTING. all lowercase is rather informal.
- Remember the person on other end is human. Consider this when writing messages on emotional or controversial issues.

## CMC in the Classroom

> *"Computer-mediated communications can — with sound educational design — provide a highly active and interactive and effective group learning environment."* (Harasim, 1987, p. 185)

Recall this scenario at the beginning of this paper:

> A course in which your students take part in discussions both in and outside of class. In these discussions, the normally quiet or shy students participate as much as the outspoken students. No one interrupts. Each person has as much time as they need to contribute to the discussion. They are able to take part in the discussions at 1 p.m. or 1 a.m., whenever it is most convenient for them. They can participate from the comfort of their own home or dorm room.

Such a course is possible through the use of computer-mediated communication. Hiltz (1986) at the New Jersey Institute of Technology team taught a course that utilized such guest lecturers. Course topics included computers and society, the use of microcomputers in teaching, and personnel management techniques. Computer-mediated communication was the primary instruction medium for the class. The first week of the course was a get acquainted time in which participants met each other and ground rules for the course were established. Surveys of students in each class revealed that most students felt less inhibited about taking part in discussions over the computer. Student motivation to do a thorough job on assignments was increased because they knew classmates would be reading them.

The first scenario of a class in which discussions occur both in and outside of the classroom is not too different from what Davie (1988) did at the Ontario Institute for Studies in Education. Davie taught two distance education graduate courses via computer-mediated communication that utilized discussion and written essays. In these courses the classes met twice face-to-face, once at the beginning to introduce the course and train them on the computer conferencing system and once at the end to discuss the course. Davie felt that having students work together on joint papers worked better than having each student do individual papers. The student satisfaction with the courses was high.

Computer-mediated communication can increase student/instructor contact through electronic mail or computer conferencing. Answers to common questions

can be saved and recycled when the question recurs. This follows another scenario from the beginning of the paper:

> Students ask you questions without calling on the phone, visiting during office hours, scheduling an appointment or meeting face-to-face. You answer the questions when it is convenient for you and can reply to similar questions from several students all at once rather than having to repeat it over to each student.

Phillips & Santors (1989) at the Pennsylvania State University experimented and redesigned a traditional group discussion course to use computer-mediated communication. The course taught communication skills appropriate to group problem solving. Their experiences with the experiment lead them to incorporate computer-mediated communication as a regular component of the curriculum. Students were grouped together and each group had to complete several tasks and solve a problem. In the end, the groups each produced a written presentation of a complete plan to solving the problem. They found that students had more frequent contact with instructors, students thought highly of the course, and the work produced by the students was as good as, if not better than, the work produced in a traditionally taught course.

## CMC in Professional Development and Research

> *"BITNET is essential to functioning in Alaska as it is the only way to keep up with developments in the field. It is also useful for communicating with colleagues at other universities and with funding agencies."* A UAA faculty member (Johnston, 1992, p. 46).

Not all the applications for computer-mediated communication are for the classroom. CMC is also a research tool. Communication with colleagues is critical to many people's work and research (Johnston, 1992). Collaborative projects can be worked on without ever having to meet face-to-face. Information databases and files can be invaluable in research. Currently, the most popular use of computer-mediated communication by UAA faculty is for professional development and research (Johnston, 1992).

A study conducted in the Spring of 1992 found that electronic mail is the primary CMC tool used by UAA faculty (Johnston, 1992). The study also found that whereas all the faculty in the study used electronic mail, 58% used BITNET/Internet and only 20% utilized computer conferencing.

Many computer-mediated tools are under-utilized by faculty. The computer can be used to access archives of published and unpublished papers and research via Internet. Bulletin boards and databases of information are also available. Along the more traditional lines of research, on-line card catalogs can be searched. USENET, a computer conferencing system with over 1600 discussion groups, is a valuable source of ideas, suggestions, and information.

Like using CMC in instruction there are pitfalls to avoid when using computer-mediated communication for professional development and research. For most the largest pitfall is the learning curve that is involved in learning the new software and technological tools. The best defense for this is to have a good offense — obtain printed resources on the tools and use them. There are now many printed resources available for learning about CMC tools. In the area of Internet and BITNET, good introductory materials are appearing at an increasing rate. See the section titled "Recommended Resources" for a list of printed resources.

Another problem with computer-mediated communication is information overload. A new world of information opens up as you begin learning. There is temptation to try to take in everything at once. Having a clear focus or goal for what you are looking for helps to combat this information overload. Learn to filter and ignore information that is not directly related to your needs. Hiltz and Turoff (1985) found that "Users learn to cope with information overload after they gain sufficient experience with a system" (p. 682).

There is a rich and diverse amount of information available through the international networks. The challenge, and for many the thrill, is to find it. Uncovering one treasure or making one critical contact is often worth all the effort.

A scenario discussed at the beginning of the paper was:

> Keeping up-to-date by participating in discussions with your colleagues that involve the latest events and ideas in your field. The time of day or night or whether you are at home or in the office makes no difference in your participation.

The use of discussion groups via electronic mail and computer conferencing allows you to communicate and discuss ideas with your colleagues, no matter where they work. With both electronic mail and computer conferencing you do not have to worry about the time of day or night that you participate in the discussions. You can connect to the computer network from your office or home using a computer and modem.

Another one of the scenarios at the beginning of this paper was meeting a colleague from another country, discussing ideas, and writing a paper for publication together without ever meeting face-to-face, making a long distance phone call, or sending materials through the postal service. This is possible via discussion groups and electronic mail. In discussion groups you meet other people and discuss ideas. The discussion can move to a private exchange between you and another on-line colleague via electronic mail and you both may decide to write a paper. As you write the paper, you use electronic mail to work out the details, exchange drafts, and decide where to publish. No meetings, no long distance phone calls, and no post office.

## Computer-Mediated Communication at UAA

> *"I find that it is an excellent medium for me to communicate with my students outside of class and an excellent way of introducing them to the intricacies of the new computer literate world of which they need to develop skills in (myself included)."* A UAA Faculty member (Johnston, 1992, p. 47)

The computer revolution of the 1980's introduced microcomputers to the UAA campus. Most faculty have access to microcomputers as well as the University's VAX minicomputer system. Using microcomputers and the VAX computer, faculty can use the CMC tools of electronic mail, computer conferencing and international computer networks.

In the spring of 1992 Johnston, (1992) found that the majority of UAA faculty do not utilize computer-mediated communications. This study concluded that UAA faculty were not aware of the resources available to them and needed support in learning and using such resources. This study is Appendix A.

Computer-mediated communication resources at UAA are centered around the VAX computer systems. There are three academic VAX computers within the University of Alaska, one at each of the main campuses. Students and faculty may have usernames on all three computers if they choose. Each VAX computer has electronic mail, but computer conferencing and international network capabilities vary with each system.

### Electronic Mail

> *"E-mail brings people into contact who would not otherwise meet one another on equal ground."* (Boshier, 1990, p. 51)

Electronic mail (E-mail) was introduced to the University of Alaska in the late-70's. The University administration recognizes it as a formal mode of communication within the University. While the "official" electronic mail system is UACN Mail, there are also other electronic mail systems available for use, VMS Mail and All-In-One Mail.

UACN Mail is available and supported on the three academic VAX computers. Included in the UACN Mail support is an on-line help system, various handouts and tutorials, and training sessions. At the University of Alaska Anchorage training seminars are offered covering beginning and advanced UACN Mail as well as a series of one page handouts. The computer support group at UAA, Computing and Technology Services, publishes the "UACN Mail User's Guide" and has a short 15 minute video on "How to Log Onto the VAX and Introduction to UACN Mail" both of which are available to staff and faculty for a small fee.

There are many electronic mail systems on the market today that are comparable to UACN Mail. Two of these comparable programs are available on the VAX: VMS Mail and All-In-One Mail. VMS Mail is an electronic mail system

written by Digital Equipment Corporation (DEC), the manufacturer of the VAX computer. VMS Mail is used by many academic institutions throughout the country. A newer commercial electronic mail system from Digital Equipment Corporation is All-In-One Mail. Versions of this electronic mail system run on VAX, IBM compatible, and Macintosh computers. All-In-One Mail supports all VMS Mail commands as well as DECwindows and video terminals. The added capabilities of All-In-One Mail include networking and windowing features. Like VMS Mail, All-In-One Mail has on-line help and manuals. Support from the computing centers for these two mail products is not as extensive as it is for UACN Mail.

Any of the electronic mail systems, UACN Mail, VMS Mail, or All-In-One Mail, are suitable for use within a class at UAA. All offer similar features but support from the computer center focuses on UACN Mail. In addition, as local area networks of personal computers become more common on campus, there will be electronic mail systems that functions over a network of personal computers. The personal computer electronic mail systems offer similar features and capabilities to those on the VAX.

### Computer Conferencing

> *"I have left until last the feature about conferencing which is rarely mentioned, certainly not in published papers, but which is the primary motivator of most diehard conferencers: it is great fun! .... The element of surprise, suspense and curiosity is roused - 'what has developed since I last logged on?'."* (Mason, 1988a, p. 40)

There are three different computer conferencing at the University of Alaska: VAX Notes, PortaCOM, and USENET. Each system can be used for incorporating computer conferencing into the classroom. USENET is popular with students on the Anchorage and Fairbanks systems and PortaCOM has a large following on the Juneau computer system.

VAX Notes is a conferencing system from Digital Equipment Corporation. It is only available on the Anchorage VAX computer. Notes is used by a variety of academic institutions across the country for computer conferencing. It allows you to set up who has access to a conference and to set up multiple conferences for a specific class. For more information on VAX Notes, you can type HELP NOTES from the $ prompt on the Anchorage VAX.

PortaCOM is a computer conferencing and electronic mail system available on the Juneau VAX system. Conferences can be public (open to everyone) or private (the moderator controls access). The University of Alaska Southeast (UAS) uses this system for delivery of some credit courses.. Documentation on PortaCOM can be requested by sending a message to JXHELP and to request access to the PortaCOM system, send a mail message to JXSYMGR. When signed onto the

Juneau computer you can type EXPLAIN PortaCOM at the $ prompt to view the PortaCOM Reference Guide.

USENET, accessed through a program called ANUNews, is available on the Anchorage and Fairbanks computers. USENET is a global conferencing system with a diverse range of conference topics. Currently the University of Alaska receives over 1600 different conferences from all over the world. Documentation and training on ANUNews is available from Computing and Technology Services at UAA. Conferences can be set up for University of Alaska classes. To request a conference be set up for your class, send a mail message to AXSYMGR.

## Computer Networks

> *"Computer networks are no longer just for computer scientists and hackers."* (Arms, 1990, p. 24)

At the University of Alaska, students and faculty have access to Internet and BITNET. The University has had limited access to these networks since the late 1980's. In 1992 Internet and BITNET access was opened to anyone with an account on the VAX.

Both Internet and BITNET are information-rich resources. The frustration of using such resources is there is no overall directory or guide to the resources. This is due to the dynamic nature of the networks. Individuals and institutions who provide the resources can change, add, or remove resources without notification. This makes record keeping of these resources difficult at best. The technology itself is the best solution to its own problem; special programs have been developed to help track the changing files and locations. In addition, various individuals post information on resources in the computer conferences and many bulletin board systems to help track the changing resources. This dynamic nature of the networks encourages exploratory and experimental learning.

To access BITNET or Internet, you do not need a separate username. Access to BITNET and Internet is through your standard VAX username. Using Internet or BITNET is like using the four-wheel drive option on many cars. You do not use four-wheel drive all the time, but it is there as an option when you need it. You may have to learn a few additional handling techniques to drive in four-wheel. Similarly, the commands to use BITNET and Internet are available as an option on your VAX username. You may need to learn a few new skills before you are able to use these network options.

Books are starting to appear that discuss Internet and/or BITNET. There are also files and handbooks available over the networks that cover network features. Many are available through the networks. See the section titled "Recommended Resources" for printed materials on the networks.

## Summary

*"The power and potential impact of CMC is not only in the ability of people to communicate when it is convenient for them, but in the fact that the computer can be used to allow people to find one another and to organize themselves into groups."* (Turnoff, 1989, p. 111)

Computer-mediated communication is a tool for instruction and professional development. It has been demonstrated that CMC can be used successfully at the postsecondary level (Brookshire, 1991; Davie, 1987; Mason, 1988). It is also used by many UAA faculty for research and professional development purposes (Johnston, 1992).

The potential for computer-mediate communication lies in developing new educational applications. New technologies are often applied to solve existing problems. Finding new ways in which to apply new technology is where the potential and challenges lie. Computer-mediated communication is no exception.

The components of CMC are available for use at the University of Alaska Anchorage. All that is needed are teachers willing to take the challenge and move towards the global classroom of tomorrow.

## Recommended Resources

### Guides and Handbooks

**NorthWestNet User Services Internet Resource Guide (NUSIRG)**
**Description:** Highly recommended for anyone who is interested in learning about computer-mediated communication on the Internet. It is a well-written beginner's guide that covers what you can use the computer network for and "how to get there from here." It covers the basic tools in Internet and BITNET and how to use them. There is a special section that addresses using the Internet for K-12 teachers.
**Available at:** UAA Library Reserve Desk under the "Computing and TS CaTS" listings. Also available over the network from ftphost.nwnet.net in the directory nic/nwnet/user-guide. Printed copies can be ordered for $ 20 from: NorthWestNet, NUSIRG orders, 15400 SE 30th Place, Suite 202, Bellevue, WA 98007, (206) 562-3000.

**Zen and the Art of Internet by Brendan P. Kehoe**
**Description:** Like NUSIRG, this highly recommended guide covers an introduction to the networks and electronic mail, FTP, USENET, Telent and many other resources.
**Available at:** UAA Library Reserve Desk under the "Computing and TS CaTS" listings. Also available over the network from ftp.cs.widener.edu in the pub/zen directory. An updated version of this guide was published in the Fall 1992.

**Internet Resource Guide by NSF Network**
**Description:** This often mentioned guide is a good reference for different resources that are available over the Internet.
**Available at:** UAA Library Reserve Desk under the "Computing and TS CaTS" listings. Also available over the network from nnsc.nsf.net in the resource-guide directory.

### Other Information Resources on Internet

| Name | Available on | Directory (file) |
|---|---|---|
| Hitchikers Guide to the Internet | ftp.nisc.sri.com | rfc (rfc1118.txt) |
| Information Sources | ftp.rpi.edu | pub/communications (internet-cmc) |
| CERF Net Guide | nic.cerf.net | cerfnet |
| NYSER Net Guide | nysernet.org | pub/guides |
| Yanoff's Internet Services List | csd4.csd.uwm.edu | pub (inet.services.txt) |

**USENET Discussion Groups**

News.announce.newuser
This group is a must for anyone starting out in USENET. It contains helpful and informative postings dealing with USENET culture and guidelines.

News.announce.newgroups
Announcements of and considerations for new groups.

News.announce.conferences
Announcements of conferences and calls for papers from all over the world.

Ua.general
Discussions on topics of general interest to students, staff, and faculty at the University of Alaska.

Ua.uaa.general, ua.uaf.general, ua.uas.general
These groups are for discussions of topics related to each campus.

Ua.config
Announcement of and requests for new groups to be added to our system.

**Computing and Technology Services Handouts**

Computing and Technology Services provides a series of handouts on Internet and BITNET. These are brief, one page introductions to the topics.

Introduction to Internet
Guide to BITNET
Introduction to Telnet
Introduction to FTP
FTP Resource Summary

**Computing and Technology Services Seminars**

Currently Computing and Technology Services offers two hour short courses on using the network resources, Introduction to the International Networks and Introduction to ANUNews. Check the consulting office for the latest seminar schedule.

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## Appendix A.

Faculty Use of Computer-Mediated Communication

at the University of Alaska Anchorage

Valerie L. Johnston

ED 627 Education Research

University of Alaska Anchorage

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Abstract

This study examined the use of computer-mediated communication by the faculty at the University of Alaska Anchorage. A questionnaire was developed that investigated how often and for what purposes faculty members utilize computer-mediated communication. The questionnaire was distributed to faculty with computer accounts on the University VAX computer system via the electronic mail system.

The response from the faculty indicated a low level of computer-mediated communication usage. Especially low was the use of computer-mediated communication for instruction. Many faculty commented on their desire to see more information and training on computer-mediated communication and its uses.

## Introduction

Communication is essential to the educational process. Traditional methods of communication include oral, written, visual, and audio-visual. A communication system that is gaining acceptance in education is computer-mediated communication (CMC).

Computer-mediated communication is the use of electronic mail and computer conferencing to communicate with other people via the computer. In the broadest sense computer-mediated communication also includes information databases, library card catalogs, and file archives. These services are accessible via computer networks (Van Duren, 1989; Mason, 1989).

Electronic mail is a computer based method of one-to-one or one-to-many communications. A person can compose and send an electronic mail message to other people on a computer system or over a network of computer systems. Electronic mail can be thought of as an electronic version of the U.S. Postal Service for delivery of written materials.

Computer conferencing, a computer based mode of many-to-many or group communications, does not directly compare to

any other communications medium. The closest analogy is to a standard conference meeting in which participants are in separate rooms at different times but the discussion still takes place in an orderly manner. With computer conferencing many people post messages on a specific topic to a common area that can be read and added to by others.

Problem Statement

The University of Alaska Anchorage (UAA) has electronic mail, computer conferencing, and access to international network services through the VAX computer system. Based upon the author's personal experience, as both a student and a staff member in the computer support center, the author has found that few faculty members are aware of or fully utilize computer-mediated communication. As a result, computer resources may be under-utilized and instructional and professional development opportunities may be unexplored by faculty.

Review of the Literature

Computer-mediated communication is not a new technology. The electronic mail and computer conferencing components of

computer-mediated communication have existed since the 1970's (Brookshire, 1991; Turnoff, 1989). Since that time many aspects of computer-mediated communication have been researched (Brookshire, 1991).

The research on computer-mediated communication has included the areas of evaluating the technology (Hiltz & Johnson, 1989; Lorentsen, 1989; Mason, 1989), comparisons to other communications media (Stix, 1986; Turnoff, 1989), social and psychological factors (Boshier, 1990; Somekh, 1989), use in distance education (Davie, 1988; Kaye, 1989; Paulson, 1991), educational applications (Graddol, 1989; Harasim, 1986; McCreary & Van Duren, 1987) and professional development (Hiltz & Turnoff, 1985; Pullinger, 1986; Spitzer, 1991).

In addition to the research, there are many examples, tips, and guidelines for using computer-mediated communication in an educational setting (Brochet, 1986; Hiltz, 1986; Kerr, 1986; Mason, 1991; Phillips, 1988). Computer-mediated communication is used throughout the United States and the world for educational purposes

(Davie, 1987; Hunter, 1990; Phillips, Santors & Kerehn, 1988; McCreary & Van Duren, 1987).

Purpose of Study

This study investigates how UAA faculty utilize computer-mediated communication. Frequency of use, level of instructional and professional use for electronic mail, computer conferencing, and network services for UAA faculty were examined. In addition, examples and recommendations were obtained from faculty for professional and instructional applications of computer-mediated communication.

## Method

Subjects

During the Spring 1992 semester there were 362 full-time faculty members employed by UAA (D. McWilliams, personal communication, April 20, 1992). In addition, there were approximately an additional 800 adjunct (temporary, part-time) faculty members.

Subjects for this study were the faculty at UAA during the Spring 1992 semester with VAX usernames (accounts). There were

376 faculty with VAX usernames. The subjects included faculty from all the UAA campuses in Anchorage, Mat-Su, Valdez, Kenai, and Kodiak.

Instrument

A questionnaire was developed to examine faculty members level of involvement with computer-mediated communication. Level of involvement was determined by a) awareness of applications for classroom and professional development and b) experience in using computer-mediated communication.

Thirteen questions were formulated to measure respondents level of involvement with computer-mediated communication. A copy of the questionnaire is included in Appendix A.

After the questionnaire was edited by several people, it was sent to six faculty members via electronic mail as a pretest. It was preceded by a message explaining the purpose of the pretest. Three of the six responded to the pretest within a day. The remaining three did not respond before the questionnaire was sent out later that week. No changes to the questionnaire were recommended.

Materials/Apparatus

The electronic mail system (UACN Mail) was used to distribute the survey to UAA faculty. The UACN Mail system exists on a VAX 8800 that is networked with the other University of Alaska campuses as well as two international networks, BITNET and NorthWestNet (NSFNet/Internet).

Design and Procedure

Any faculty member at UAA may obtain an account on the University's VAX computer system. Since computer-mediated communication requires the use of the computer system, subjects for this study were the on-line faculty (faculty with usernames) at UAA.

A list of on-line faculty was compiled by using the VAX WHO database. This database contains the usernames of all the accounts throughout the University of Alaska. The list was obtained by doing a wildcard search for all faculty accounts at the specified locations. For a more complete discussion of h. w this was completed, see Appendix B, Using Mailing Lists and UACN Mail.

The questionnaire was sent on April 2, 1992 as a registered mail message to the list of faculty usernames with a requested

return-date of April 13, 1992. Faculty members who did not respond by the requested date were sent the questionnaire again with a return date of April 17, 1992.

As each faculty member read their registered mail message with the questionnaire, an acknowledgement message was returned to the sender. The number of faculty who actually read their mail was tracked by the number of acknowledgement messages received. This number was used for comparison to the number of on-line faculty, the number of returned questionnaires, and the total number of faculty members.

One problem encountered in selection of the sample was inaccurate assignment of usernames. Staff and faculty usernames are named differently. The selection of faculty for this study was based on the username. As a result of inaccurate assignment of usernames, some faculty usernames are used by non-teaching staff and some faculty have staff accounts rather than faculty accounts. The consequences of this are that some non-teaching staff received the questionnaire and other on-line faculty were not included in the sample. The former was taken into account in the questionnaire

design by asking the faculty to indicate if they were full-time, adjunct (part-time), or other. Those who selected the other category were excluded from the calculations. The latter consequence was not accounted for and was assumed to be small enough not to make a significant difference in the results collected.

A strategy to counteract this problem would have been to obtain a list of names of current faculty members and verify the list of faculty usernames from the WHO database. It is not known how difficult it would be to obtain such a list from the University.

Another problem encountered in this study is that many faculty have usernames on the VAX system but have never used them. By using a registered mail message, it was possible to track who read their mail. The response rate would then accurately reflect the number questionnaires that were received and read.

As questionnaires were received, they were coded on data entry sheets. Each questionnaire was compared for accuracy with the coded information. The data was entered into a file on the VAX computer system and proof-read for accuracy.

The results were compiled on the VAX computer and analyzed using the SPSS (Statistical Package for the Social Sciences) computer program. A copy of the SPSS program is included in Appendix C.

## Results

A questionnaire with the number of responses per question and the corresponding percentage of responses is included in Appendix D.

### Response rates

The survey was sent out to 376 faculty with usernames. A total of 184 people out of 376 (49%) read their electronic mail and received the questionnaire. There were 92 respondents to the questionnaire for a response rate of 50%.

### Respondents

Respondents were asked to identify themselves as permanent faculty, adjunct (part-time) faculty, or other. Seven respondents selected other and were eliminated from the computations. This left 85 valid respondents.

Of the 85 respondents, 80% (68) indicated that they were permanent faculty and 20% (17) said they were adjunct faculty. The 68 permanent faculty respondents in this study represent 19% of the

total population of permanent faculty members (362). The 17 adjunct faculty members constitute approximately 2% of the adjunct faculty population.

Frequency of usage

Electronic mail.

The majority of respondents, 34.1% (29 faculty), indicated that they receive up to 4 electronic mail messages in a week. Similarly, 44.7% (38 faculty), indicated they send up to 4 mail messages a week. The percentages for all categories are listed in Table 1.

Table 1

Frequency of Electronic Mail Usage

| Number of Messages Per Week | Sent | Received |
|---|---|---|
| 0 to 4 | 44.7% | 34.1% |
| 5 to 9 | 21.2% | 25.9% |
| 10 to 14 | 23.5% | 22.4% |
| 15 or more | 10.6% | 17.6% |

Computer Conferencing and Network Services.

Most faculty members said they were not aware of (48.2%) or did not use (31.8%) computer conferencing. For network services, one third (33.3%) said that they utilize network services between 1 and 3 times a week. The percentages for the categories of computer conferencing and network services are listed in Table 2.

Table 2

Frequency of Computer Conferencing and Network Usage

| Category | Computer Conferencing | Network Services |
|---|---|---|
| Not aware of | 48.2% | 11.9% |
| Do not use | 31.8% | 29.8% |
| 1 to 3 times/week | 12.9% | 33.3% |
| 4 to 6 times/week | 3.5% | 16.7% |
| 7 to 9 times/week | 1.2% | 4.8% |
| 10 or more times/week | 2.4% | 3.6% |

Level of instructional use

The questionnaire showed that the majority of faculty do not use electronic mail (53.8%), computer conferencing (75.6%), or network services (71.2%) for instruction. The next largest grouping is those who have considered using computer-mediated communication in their courses. Just over 20% have considered using electronic mail, 13% contemplated computer conferencing, and almost 22% have thought about using network services.

The smallest response was from those who have used computer-mediated communication as either a required or optional part of a course. Electronic mail had the highest usage in this area, with 10.3% (8 faculty) requiring it and 15.4% (12 faculty) having it as an optional part of their courses. Computer conferencing was the next highest with 4.4% (2 faculty) requiring its use and 6.7% (3 faculty) having it as an optional part of the course. Network services finished lowest with only 2.7% (2 faculty) requiring use and 4.1% (3 faculty) using it as an optional part of a course.

Level of professional use

Professional use of computer-mediated communication was examined by looking at how it was used by faculty members. For electronic mail this involved investigating who they corresponded with over the computer: people within their own departments, within UAA, within the University of Alaska (including other campuses), or outside the University of Alaska (UA) over one of the networks. Electronic mail is used by 67.9% of the respondents to communicate within UAA. Next was using electronic mail within the University of Alaska, 65.5%, and outside UA over the networks, 64.3%. The lowest use of electronic mail was within their own department (54.8%).

The majority of respondents, 79.2%, who said they were aware of computer conferencing indicated that they do not use it. For those who use computer conferencing, 14.6% indicated that they use it to keep up-to-date in their field and to learn about other areas. The lowest response (6.3%) was from faculty members who indicated they use computer conferencing for recreational purposes.

For those who were aware of network services, the use of electronic mail (72%) was the most frequent use. The next highest

response, 28%, said that they do not use network services. Close to that was participation in special interest or discussion groups at 26.7%. Table 3 lists the percentage of responses for each use category.

Table 3

Use of Networks

| Category | Percentage of Cases |
|---|---|
| Do not use network services | 28.0% |
| Access files on other systems | 21.3% |
| Information databases | 13.3% |
| Library Catalogs | 14.7% |
| Electronic Mail | 72.0% |
| Discussion Groups | 26.7% |
| Access to other computer systems | 13.3% |
| Other network uses | 1.3% |

Applications, comments, and recommendations

The last two open ended questions in the questionnaire dealt with instructional applications, recommendations, and comments about electronic mail, computer conferencing, and network services. Appendix D contains a full listing of the comments from questions 12 and 13.

The majority of examples of instructional applications involved using electronic mail as a communications tool between instructor and student. Others used electronic mail to receive and turn in assignments, for cooperative learning with students at other institutions, as a research tool, and as a part of distance education. Recommendations for better utilization included more training and information on resources and the need for more people to participate in using computer-mediated communication.

When asked for general comments about computer-mediated communication, many faculty commented about their reliance on it to communicate with colleagues and students. They also mentioned the need for more training and information on the available resources,

the need to get more people involved, and their use of it for research purposes.

## Discussion

The response rate for those who received the questionnaire compared to those who responded was 50%. In a traditional mail-out questionnaire, the response rate is typically number of questionnaires sent out compared to the number received. Using this method for this study, the response rate for the study drops to 24.47%.

Although the response rate was below the desired 70% for a descriptive study, the response from the permanent faculty members represents 19% of the total population of permanent faculty. Therefore this study can be considered valid with respect to permanent faculty. The study cannot be considered as representative of the adjunct faculty, due to the low percentage of adjunct respondents.

Using electronic mail to circulate th questionnaire proved to be a good method of distribution. The advantages included low cost, more accurate response rate, and faster turn around time There were no costs associated with duplicating or distributing the

questionnaire as there would have been with a paper mail-out study. The response rate accurately reflected the number of people who received the questionnaire and there was no error due to postal delivery problems. The turn around time was also faster. The first response to the questionnaire was received within twenty minutes after it was sent out. The delivery time for electronic mail responses is seconds rather than days.

The disadvantages of using electronic mail to distribute the questionnaire included the respondents level of computer knowledge, inactive usernames, inaccurate assignment of usernames, and the number of people using the computer system. If the respondent is not comfortable using the computer system, they are less likely to respond to the survey or questionnaire. For these people, the technology presents a barrier that they have not yet overcome. Only half (49%) of the faculty with usernames read their mail in the 16 days the questionnaire was distributed. This indicates there is a high number of faculty whose usernames are either inactive or used infrequently. This becomes a disadvantage when trying to determine the number of faculty with usernames. Inaccurate assignment of

usernames is a disadvantage when trying to obtain information from a specific strata or class of the university community. The number of people using the computer system is low enough that it cannot be considered to be a true random selection of university community.

From the results of this study, it appears that faculty use of computer-mediated communication is low. With electronic mail, messages are sent or received on an average of less than one per day. Most faculty are not even aware of computer conferencing and use network services on an average of 1 to 3 times a week.

An overwhelming majority, between 53% and 75%, do not use and have not considered computer-mediated communication in instruction. Under 20 faculty members indicated that they have made electronic mail a required or optional part of the course and that number drops to 5 each for computer conferencing and network services.

Concerning the level or type of professional use of computer-mediated communication, the majority utilize it to keep in touch with colleagues and developments in their field. Those who use computer-mediated communication tend to treat it as a tool. When asked for

comments about it, many faculty stressed the importance of keeping in touch with colleagues. They also indicated a desire to see more information and training on how they can use computer-mediated communication.

From this study it appears that computer-mediated communication would be utilized more by the faculty at UAA if there was increased awareness, information, and training on it. The use of c .nputer-mediated communication at UAA may help reduce faculty feelings of isolation, increase collaboration between colleagues, and increase instructional options.

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Appendix A

Copy of Questionnaire

Please take several minutes to answer this mail message. The following 13 questions are part of a research project examining faculty uses of electronic mail, computer conferencing, and network access at UAA. It is hoped that the information from these questions will add to the teaching excellence efforts of UAA faculty.

Your participation is strictly voluntary. Your responses are confidential; your name will not be associated with your answers in any public or private report of the results without your permission.

Please respond by April 13, 1992 via mail message to AAVE698 or send a printed copy to: Valerie Johnston, P.O. Box 111065, Anchorage, Alaska 99511. To answer each question on-line, edit this message and place an X in the appropriate boxes, or send your responses in the format of question number and letter answer (for example: 1. B).

=-=-=-

2. On average, I send _____ electronic mail messages in a week (select one).
[ ] a) 0-4
[ ] b) 6-9
[ ] c) 10-14
[ ] d) 15+

3. I use electronic mail to communicate with colleagues or others (select all that apply):
[ ] a) within my department
[ ] b) within UAA
[ ] c) within UA (includes Fairbanks & Juneau)
[ ] d) outside UA (includes Internet & BITNET)

4. The following best describes my instructional use of electronic mail (select one):
[ ] a) I require my students to use it.
[ ] b) It is an optional part of my course(s).
[ ] c) I have considered utilizing electronic mail.
[ ] d) I have not considered using it.

SECTION 2. COMPUTER CONFERENCING
At UAA we have access to several computer conferencing systems for many-to-many communications such as PortaCom, VAX Notes, USENET/ANUNews.

5. My use of computer conferencing is best described by (select one):
[ ] a) I was not aware we had such systems (Please proceed to question 8).
[ ] b) I was aware of, but do not use these systems.
[ ] c) 1 - 3 times a week
[ ] d) 4 - 6 times a week
[ ] e) 7 - 9 times a week
[ ] f) 10 or more times a week

6. My instructional use of computer conferencing is best described as (select one):
[ ] a) I require my students to use it.
[ ] b) It is an optional part of my course(s).
[ ] c) I have considered utilizing computer conferencing.
[ ] d) I have not considered using it.

7. I use computer conferencing systems via the VAX to (select all that apply):
[ ] a) I do not use any computer conferencing systems.
[ ] b) stay up-to-date in my field.
[ ] c) read about recreational areas I'm interested in.
[ ] d) learn about other fields/areas of interest.

SECTION 3. BITNET AND INTERNET
Through the VAX computer system at UAA we can access other computers and
information systems over networks such as BITNET and Internet.

8. My use of network services on BITNET or Internet is best described by
(select one):
[ ] a) I was not aware of such services (Please go to question 11).
[ ] b) I was aware of network services, but do not use them.
[ ] c) 1 - 3 times a week
[ ] d) 4 - 6 times a week
[ ] e) 7 - 9 times a week
[ ] f) 10 or more times a week

9. The following best describes my instructional use of network services
(select one):
[ ] a) I require my students to use it.
[ ] b) It is an optional part of my course(s).
[ ] c) I have considered utilizing these network services.
[ ] d) I have not really considered using them.

10. Which of the following have you accessed over BITNET or Internet (select all that apply):
[ ] a) I have not used BITNET or Internet.
[ ] b) files on other computer systems
[ ] c) databases
[ ] d) on-line library catalogs
[ ] e) electronic mail access to national and international colleagues
[ ] f) special interest groups (sigs), BITNET mailing lists, discussion groups
[ ] g) other computer systems
[ ] h) other (please specify): _____

11. I am (select one):
[ ] a) Adjunct Faculty
[ ] b) Permanent Faculty
[ ] c) Other, describe: _____

12. If you utilize electronic mail, computer conferencing, or BITNET/Internet in a course, briefly describe your
a) instructional applications:

and b) recommendations for better instructional utilization:

13. Do you have any other comments or recommendations about electronic mail, computer conferencing, and/or BITNET/Internet?

Thank you for your time and assistance!

Appendix B

Using Mailing Lists and UACN Mail

Creating a mailing list of the UAA faculty members was a three step process. The first step was to give a command to capture the information to a file, then give the search command for UAA faculty, and finally, editing out extraneous material from the file.

This process requires an understanding of how usernames are constructed at the University of Alaska. The first letter of the username is a one character location code. The location codes used in this study are A, P, V, D, and I for Anchorage, Palmer/Mat-Su, Valdez, Kodiak, and Kenai. The second letter is the type code and corresponds to a persons' relationship to the university. For faculty usernames, the type code is F. The remaining portion of the username is the person's initials. To illustrate, Kodiak faculty member Jane E. Doe would have a username of DFJED.

For the first step in the process, using the VAX VMS operating system, the command:

DEFINE/MODE=USER_MODE SYS$OUTPUT FILENAME

will capture the results of the next command to the filename specified. For example, to prepare a file of Palmer/Mat-Su faculty usernames, the command used was:

DEFINE/MODE=USER_MODE SYS$OUTPUT PF_FACULTY.

The next step was to give the command to search the WHO database for the faculty usernames. The WHO database has the ability to do wildcard searches. By giving the command WHO PF*, the WHO database will list all usernames which start with PF (Palmer/Mat-Su faculty).

The WHO database provides information on the username, the name of the username owner, and the name of their home computer. For a mailing list, only the username can be in the file, therefore the other information must be edited out. The EDIT/TPU editor was used to edit out the unnecessary information.

A batch file was constructed with the editor to use the mailing list and send out the questionnaire. The questionnaire was also a file on the VAX. The batch file contained five commands similar to this one to send the questionnaire out as a registered mail message:

$ mail send/register %af_faculty. <questionnaire.

The SEND/REGISTER command creates an acknowledgement message as each message is received and read. As acknowledgement messages were received they were moved to a separate storage area in the mailbox (a physical file folder). Similarly as questionnaire responses were received, they were moved into another separate area. Using the UACN Mail command NUMBER SUMMARY, information on the number and type of acknowledgement messages and questionnaire messages was obtained.

After each questionnaire deadline, the unread questionnaires were deleted by using the UACN Mail KILL command. This was done with a batch file similar to the one used to send the questionnaire. It contained five commands similar to:

$ mail kill %af_faculty.

Appendix C

SPSS Program

```
$SPSS/NOMANAGER/NOBANNER/output=[aave698.survey]cmc.log
TITLE "Faculty Use of Computer Mediated Communications at UAA"
SET WIDTH = 80
SET PRINTBACK=NO
DATA LIST FILE="disk$a:[aave698.survey]cmc.dat"/
        RECMSG 1
        SENDMSG 2
        MSGDEPT 3
        MSGUAA 4
        MSGUA 5
        MSGOUAA 6
        MAILINST 7
        CONFUSE 8
        CONFINST 9
        CONFDNU 10
        CONFUP 11
        CONFREC 12
        CONFLEAR 13
        NETUSE 14
        NETINST 15
        NETDNU 16
        NETFILE 17
        NETDBS 18
        NETLIB 19
        NETEMA 20
        NETSIGS 21
        NETCOMP 22
        NETOTHER 23
        FACTYPE  24
VARIABLE LABELS
        RECMSG  'Number of e-mail messages received'
        SENDMSG  'Number of e-mail messages sent'
        MSGDEPT  'Messages within department'
        MSGUAA  'Messages within UAA'
        MSGUA  'Messages within UA'
        MSGOUAA  'Messages outside of UA'
        MAILINST 'E-mail: instructional use'
```

```
        CONFUSE  'Use of computer conferencing'
        CONFINST 'Conferencing: instructional use'
        CONFDNU  'Do not use conferencing systems'
        CONFUP  'Conferencing to stay up-to-date'
        CONFREC  'Recreational use of conferencing'
        CONFLEAR 'Use conferencing to learn other areas'
        NETUSE  'Use of networks'
        NETINST  'Networks: instructional use'
        NETDNU  'Do not use networks'
        NETFILE  'Access files on other systems'
        NETDBS  'Access databases'
        NETLIB  'Acess on-line library catalogs'
        NETEMA  'E-mail to colleages'
        NETSIGS  'Special interest groups, discussion groups, etc.'
        NETCOMP  'Access other computer systems'
        NETOTHER 'Other network uses'
        FACTYPE  'Faculty type'
VALUE LABELS
  RECMSG   1 '0-4 msgs' 2 '5-9 msgs' 3 '10-14 msgs' 4 '15+ msgs'/
  SENDMSG   1 '0-4 msgs' 2 '5-9 msgs' 3 '10-14 msgs' 4 '15+ msgs'/
  MAILINST  4 'Do not use' 3 'Considered' 2 'Optional' 1 'Required'/
  CONFUSE   1 'Not aware' 2 'Do not use' 3 '1-3 times' 4 '4-6 times'
            5 '7-9 times' 6 '10 +'/
  CONFINST  4 'Do not use' 3 'Considered' 2 'Optional' 1 'Required'/
  NETUSE   1 'Not aware' 2 'Do not use' 3 '1-3 times' 4 '4-6 times'
            5 '7-9 times' 6 '10 +'/
  NETINST   4 'Do not use' 3 'Considered' 2 'Optional' 1 'Required'/
  FACTYPE   1 'Adjunct' 2 'Permanent' 3 'Other'
select if (factype=1 or factype=2)
Frequencies variables=recmsg sendmsg mailinst confuse confinst
     netuse netinst factype
mult response groups=msgs 'Where messages are sent' (msgdept to
   msgouaa (1))
confer 'Uses of computer conferencing' (confdnu to conflear (1))
network 'Uses for network' (netdnu to netother (1))
/frequencies=msgs confer network
recode mailinst confinst netinst (1 thru 2 = 5)
value labels
  mailinst confinst netinst 5 'Use in classroom'
  4 'Do not use' 3 'Considered'
frequencies variables=mailinst confinst netinst
mult response groups=confer2 'Uses of computer conferncing'
  (confup to conflear (1))
```

network2 'Uses for network' (netfile to netother (1))
/frequences=confer2 network2
finish

Appendix D

Questionnaire Results

Results for each question are displayed in the format:
Number of Responses (Percentage of Responses)

=-=-=-

2 (2.4%) f) 10 or more times a week

6. My instructional use of computer conferencing is best described as (select one):
2 (4.4%) a) I require my students to use it.
3 (6.7%) b) It is an optional part of my course(s).
6 (13.3%) c) I have considered utilizing computer conferencing.
34 (75.6%) d) I have not considered using it.

7. I use computer conferencing systems via the VAX to (select all that apply):
38 (79.2%) a) I do not use any computer conferencing systems.
7 (14.6%) b) stay up-to-date in my field.
3 (6.3%) c) read about recreational areas I'm interested in.
7 (14.6%) d) learn about other fields/areas of interest.

8. My use of network services on BITNET or Internet is best described by (select one):
10 (11.9%) a) I was not aware of such services
25 (29.8%) b) I was aware of network services, but do not use them.
28 (33.3%) c) 1 - 3 times a week
14 (16.7%) d) 4 - 6 times a week
4 (4.8%) e) 7 - 9 times a week
3 (3.6%) f) 10 or more times a week

9. The following best describes my instructional use of network services (select one):
2 (2.7%) a) I require my students to use it.
3 (4.1%) b) It is an optional part of my course(s).
16 (21.9%) c) I have considered utilizing these network services.
52 (71.2%) d) I have not really considered using them.
10. Which of the following have you accessed over BITNET or Internet (select all that apply):
21 (28.0%) a) I have not used BITNET or Internet.
16 (21.3%) b) files on other computer systems
10 (13.3%) c) databases
11 (14.7%) d) on-line library catalogs
54 (72.0%) e) electronic mail to national & international colleagues
20 (26.7%) f) sigs, BITNET mailing lists, discussion groups
10 (13.3%) g) other computer systems
1 (1.3%) h) other (please specify): _____

11. I am (select one):

17 (20.0%) a) Adjunct Faculty
68 (80.0%) b) Permanent Faculty
7 (Not included in calculations) c) Other, describe: _____

12. If you utilize electronic mail, computer conferencing, or BITNET/Internet in a course, briefly describe your
a) instructional applications:
and b) recommendations for better instructional utilization:

1) a) instructional applications:
I allow/encourage e-mail communication for students to confer on assignments, clarify instructions, submit papers, or just chat.
and b) recommendations for better instructional utilization:
* We need to be able to transmit non-ascii text files (WORKS, WORD, WORDPERFECT, etc.) as e-mail messages. If that is possible now, I am unaware of the capability. It is frustrating to be limited to the use of word processors like Wordstar or Sidekick notepad to compose messages for transmission.

2) Provide e-mail as a way for students to contact me as they work on computer project in research class. Have used materials obtained by e-mail as subject matter for one course.

3) AM NOT CURRENTLY USING IN A COURSE, HOWEVER, AS I BEGIN TO TEACH UPPER LEVEL COURSES I WILL.

4) a) Thus far, I haven't used computer conferencing as a part of any of my courses. My greatest use has been in communicating with former students and other colleagues within Alaska and in other parts of the country.
b) I will make better use of computer instructional features when I get more training. So far I haven't made myself available to learn how to exploit that various data bases--library and other--that are most likely available around the country.

5) I use the system to make the student more aware of what is available as a tool.
Thanks....

6) A TEACH CLASSES TO STUDENTS IN REMOTE LOCATIONS. HAVE REQUIRED MAIL IN THE PAST...

B PUBLICISES AND OFFER TRAINING....

7) If you utilize electronic mail, computer conferencing, or BITNET/Internet in a course, briefly describe your
a) instructional applications:
DO NOT USE
and b) recommendations for better instructional utilization:
GUESS I COULD USE TRAINING IN EACH AND APPLICATION IDEAS

8) b) I do not see any benefit in using any of these facilities in my field.

9) a) instructional applications:
I allow my students to use BITNET/Internet for extracurricular work, to investigate other systems. This allows the students to satiate their need to delve into the field further.
b) recommendations for better instructional utilization:

I would like you forward information to me on the facilities available with BITNET/Internet. I would like to take the opportunity to investigate the facilities further.

10) Am thinking of networking my anthro students with other students in other states for a "discussion group"; Will probably try to set a "user-group" type format. Not quite sure what's going on now and how this will work. See Vic for details.

11) Introduce students to the system in a beginning computer class for educators

12) I do not use, we need better support materials, easy documentation to make this a useful classroom tool.

13) a) instructional applications:
*Students send me their programs via mail, and I thereby receive the date and time along with the program.

14) student in DIS communicated weekly in course on embryology
it worked very well

15) a) instructional applications:
Communication tool between myself and the students, and among students

16) a) instructional applications:
COMMUNICATE with the instructor. Learn to use a basic Electronic Mail system for employment awareness.
b) recommendations for better instructional utilization:
EASIER ACCESS FOR TEACHERS statewide to get on the system and share teaching information. All teachers in Alaska should have easier access to using UACN for communication. It would strengthen all levels of the educational field. Example: high school business teachers communicating with college level teachers, etc.

17) a) instructional applications:
I give my students my UACN user name and encourage them to conference with me via the net. I respond quickly and positively to their attempts to contact me.
and b) recommendations for better instructional utilization:
Make user name automatic for all students. Encourage all faculty

to use the system to talk with their students.

18) my students are required to do paraphrasing and summary exercises based on essays in their text book and send them to me through the vax mail system.

19) a) BA 380 students must use mail for assignments. They learn about 10 commands. WHO, SET BANNER, SHOW BANNER, KILL, etc.
b) Can students use BITNET.

20) hadn't tho't about possible applications for my students. Will consider to help them access me/advice/notes, etc.

21) a) do not use directly for instruction
b) recommend more instruction on use and application

22) a) don't use - except for students to communicate with others in different university

23) I currently have 54 secondary teachers who are involved in a 3 year federally funded project commucating with NCRVE teacher eductors/researchers on the topic of integrating academic and vocational education and higher order thinking skills. They are serving as a prototype this semester for a national practitioners network.

24) I was just recently exposed to Binet and Internet at a conference in Portland Oregon. I was not aware that I could access so many information systems. The Univ. of AK system need to make faculty aware of this resource.

13. Do you have any other comments or recommendations about electronic mail, computer conferencing, and/or BITNET/Internet?

1) Use SHOW NEWS,SYGABB etc. to keep up to date on issues relating to UAA. have used VAX Notes to discuss communication issues with professionals in community and am entering a PORTACOM group to plan a research project.

2) UP TO THIS POINT I HAVE MAINLY USED E-MAIL TO COMMUNICATE WITH COLLEAGUES BOTH WITHIN THE UAA SYSTEM AND ABROAD. I CONSIDER IT TO BE AN EXTREMELY

IMPORTANT TOOL. LEARNING OTHER VAX FEATURES WILL BE OF INTEREST TO ME AS WELL.

3) I find that bitnet has been MOST useful and am looking forward to make use of internet. Should we be looking for ways that APU faculty and staff could have access? Or maybe these people have that capability and I'm just not aware of it.

4) Bitnet has occasionally been very useful in my research. I have used it to send articles electronically to journals and to communicate with other researchers. It would be even more useful if we subscribed to MATH-SCI.

5) More specific training to meet faculty needs would be helpful.

6) ITS A GREAT RESOURCE.... THANKS FOR ASKING.....

7) NEED TRAINING AS I MAKE LIMITED USE OF BITNET AND DON'T KNOW HOW TO USE COMPUTER CONFERENCING.

8) Seems to work great!

9) I am glad to have these options available, but do not want to see resources expended on them that could be better used in other areas. I personally believe that computer mail is grossly abused by many users who use it almost solely for personal purposes

10) I wish more faculty members, students and teachers used electronic mail so the telephone chase could end.

11) NOT ENOUGH DISK SPACE AVAILABLE FOR FTP USE. POOR INTERFACE ON VAX COMPARED TO UNIX.

12) BITNET is very valuable to me . I communicate with friends in Universities in Costa Rica and Germany. Please continue the service. Also the use of EMAIL within the Univ of Ak system is very useful for my communication with full time faculty members that I must deal with.

13) BITNET is essential to functioning in Alaska as it is the only way to keep up with developments in the field. It is also useful for communicating with colleagues at other Universities and with funding agencies.

14) Email is a very effective way to communicate with colleagues. I could not function well without it. A workshop on the potential uses of Email or a well written manual on the same would be welcome.

15) Need to involve others besides BCIS & CS students in using. Allow(force?) students to do more communicating. I have seen reluctant classroom writers write reams of E-mail. Involve more faculty.

16) Even though I mainly use only the E-mail system, I find the electronic communication faciltiies which UAA makes available to faculty and students very useful. I makes it so much easier to stay in touch with colleagues within and outside of the UA.

17) I could use a better understanding of its options available and the "how to" of using it effectively.

18) lines always busy, can't get on

19) I would like to see something that looks like a phone book that would have everyones address in it and also the different groups of users.

20) I understand Internet has some features that Bitnet does not have. Can you give me some info about Internet? How do I get on Internet?

21) would like to become a BITNET user but don't know how. would like to learn

22) I intend to use BITNET to communicate with some colleagues in the lower 48 sometime in the near future...

23) i would like to see concise guide/user manual "guide to bitnet/internet"
Comments: I rely on the system to keep in touch with colleagues around the country, and thus find this system critical to my ability to conduct my research activities.

24) because i am a computer neophyte, i know nothing about how this system works, and therefore nothing about how to improve upon it. i find that it is an excellent medium for me to communicate with my students outside of class and an excellent way of introducing them to

the intracacies of the new computer literate world of which they need to develop skills in (myself included).

25) I'd like to know more about computer conferencing.

26) K E E P  B I T N E T.

27) P.S. I don't know how to stop the scroll and fill in the blanks. So I just printed it out.

28) Bitnet/Internet very important for maintaining contact w/ colleagues.

29) Invaluable - I could not do without it.

30) Your department does a wonderful job with handouts and workshops! I need to put more effort into practice.

31) Encourage Administration to at least use it for mail, info distribution, etc.

32) No where do you ask any questions which would prompt the response "I'd use it if I could become aware of what is available and how to use it." Even your instructions for returning the responses presuppose an understanding of the process.

33) I think it is great. Keep the system.

34) Keep Bitnet - it is great!

35) Donna Bartman is doning her M.S. project on the perceived effectiveness of these technologies to promote staff development and reduce feelings of isolation in project teachers.

36) I'm currently recruiting 3 graduate students. I expect to use these systems more frequently in the Fall 1992.

37) Thank God it [Bitnet/Internet/electronic mail] exists!

38) Would attend training/orientation to learn how to incorporate E-mail conf. in teaching.

39) Would like training seminar to learn how to use email.