ABSTRACT
              Noting that journalism and mass communication
educators have experimented broadly with computer applications since
the 1970s, this paper suggests that momentum is building in the 1990s
in three areas (industry imperative, social significance, and
pedagogic promise) to integrate computer-mediated communication (CMC)
into the journalism and mass communication curriculum. The paper
first defines CMC and discusses its development. The paper then notes
that knowledge of and facility with CMC is becoming a requirement for
the computer literate professional of the 1990s. Two general
approaches toward the pedagogic use of CMC are outlined in the paper:
adoption of CMC in every course as a supplemental means of
student-professor and student-student communication; and introduction
of CMC into target core courses (such as media law, reporting, and
media management) where CMC would facilitate communication with and
among students, and also enhance the instruction of a number of
topics already addressed in various courses. The paper also discusses
general points to consider when putting a class "online," such as:
establishing students' computer accounts; creating a new bulletin
board or participating in an existing board; motivating usage of CMC;
and developing a student guide for the e-mail and bulletin board
technology. The paper concludes that educators must find ways to
overcome initial resistance among students and colleagues to CMC, and
must locate niches in the curriculum in which CMC could be usefully
integrated. Sixty-nine notes are included. (RS)

BECAUSE IT'S TIME:
TEACHING COMPUTER-MEDIATED COMMUNICATION

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BECAUSE IT'S TIME: TEACHING COMPUTER-MEDIATED COMMUNICATION

Introduction

Three forces have driven the increasing prominence of
the computer in journalism and mass communication in the
last 25 years. Th first has been the transformative
application of the technology in many sectors of the media
industries. For example, shortly after computers were
introduced at newspapers to streamline the production
process, journalism instructors began changing the way some
professional skills were taught to keep their graduates
competitive in the job market: reporting students received
instruction in typing in "OCR" style on IBM Selectrics,[1] and
editing students took turns doing exercises with "pencil,
glue pot and scissors" and at "CRTs."[2]

Second, the diffusion of the computer into ever larger
spheres of American society has occurred. For example, as
government activities became increasingly computerized,[3] and
thus monitorable only via analyses of electronic data,[4]
journalists recognized that they would need new kinds of
training to effectively work their beats: computer-assisted
reporting.[5]

Third, the pedagogic usefulness of computers has been
recognized by instructors. The early emphasis was on using
computers to escape the drudgery of teaching. For example,
journalism educators saw an opportunity to delegate to the

computer repetitious tasks such as writing the same correction over and again.[6] They also began to off-load instruction in remedial areas such as grammar and spelling and rudimentary topics.[7] Later the emphasis shifted to using the computer to help create a more "realistic," and thus more stimulating, learning environment. For example, through reporting simulations such as William Smith's "Bayshore Blast," instructors of beginning reporting courses were able to forsake the tired pedagogic tool of fact sheet and role-play for "an engrossing computerized race against the clock to gather information from sometimes reluctant sources."[8]

Although journalism and mass communication educators have experimented broadly with computer applications since the 1970s, one application remains on the periphery--computer-mediated communication[9]--due to a deadly combination of lack of industry interest,[10] lack of social significance,[11] and lack of awareness by educators.[12]

But momentum is building today in each of the three key force fields of industry imperative, social significance, and pedagogic promise to integrate computer-mediated communication into the journalism and mass communication curriculum. The purpose of this article is to review the developments that are making knowledge of and facility with computer-mediated communication necessary for professional competence in the 1990s, to explore the opportunities that exist in the journalism and mass communication curriculum

for such an introduction, and to offer some practical suggestions drawn from the authors' experiences in putting their classes "online."

Definition of Computer-Mediated Communication

We define computer-mediated communication as communication among individuals facilitated by computer hardware, software, and a hardwire or telecommunications link.[13] Such communication, conceptualized by Dominick as "machine-assisted interpersonal communication"[14] has been described as "a new medium for building and maintaining human relationships."[15] It lies in a blurred territory "between 'mass' and individual communication as well as between private and public spheres of communication."[16]

Software design has shaped computer-mediated communication into several different forms, including:

* Electronic mail (e-mail), in which messages meant for private perusal are distributed electronically to an individual's computer account or to a "mailing list" of specified individuals' accounts;

* Bulletin boards (BBS or boards), in which individuals post a jumble of public messages for the perusal of others with similar interests by dialing into a computer whose memory has been designated to serve as the equivalent of a cork board;

* Conferencing, in which ongoing discussions on specified topics by a group of individuals take place by

organizing participants' asynchronous queries, responses and statements into a file distributed to individuals' accounts or accessible at a designated computer;

* Chats, in which "real-time" impromptu or pre-arranged conversations take place between participants online as if on a CB radio.[17]

Development of Computer-Mediated Communication

The momentum that is building to embrace computer-mediated communication as a professional competence is due to the diffusion of this form of communication into ever-broadening spheres of American society in the last 25 years.

The beginning of computer-mediated communication dates to the early 1960s, when message-passing programs were developed for multi-user mainframe computers that allowed an operator logged in on the system to pose questions, tell jokes or just say "Hi!" to another logged-in operator. At first, this was only a novelty because all computer users sat in the same refrigerated room, but when terminals began to migrate down the hallway and across the campus, such programs, along with rudimentary mail and bulletin board programs, helped foster user communities.[18]

The creation of the nation's first computer network was the next significant development in computer-mediated communication. The U.S. Defense Department's Advanced Projects Research Agency funded a network in 1967 to serve as a laboratory for cutting-edge ideas in defense-oriented

computer science and to get more bang for the research buck by having its contract researchers share computer resources.[19] The first node of the ARPANET was established at UCLA in 1969; by 1971 the number had grown to 15 nodes, and by 1973, more than 35. Early usage data showed that the heaviest traffic on the network was electronic mail.[20] To be "on the net" in the 1970s was to be a member of the computer science elite, and connections were highly coveted.[21] Early hackers credit mailing lists developed on the ARPANET for turning geographically isolated, computer-obsessed individuals into a "worldwide hacker community."[22]

The appropriation in the 1970s of computer-mediated communication by government, business and researchers outside the defense nexus marks a third stage in the diffusion of computer-mediated communication. As Cross and Raizman noted, "the pioneer users were financially strong organizations that depended on swift, efficient communications. These included airline, transportation, insurance, and publishing companies, as well as the U.S. Government."[23] Some notable advances during this period included:

* The development of the first computer conferencing system, in 1970, by a researcher in President Nixon's Office of Emergency Preparedness, implemented as a means of inter-office coordination during the wage-price freeze of 1971;[24]

* The launch of the first public packet-switched network, Telenet, in 1975, by Bolt Beranek and Newman, the

think tank hired by the government to create the ARPANET, offering an infrastructure for private networks and computer-mediated communication services for business;[25]

* The development of new networking technologies at corporations such as Xerox, IBM, Digital Equipment and AT&T, initially used to link up their own employees, but later offered to commercial customers;[26]

* The organization of a number of new wide area networks to serve the communication needs of academics, many of whom were interconnected through the use of "internet" protocols to the privileged ARPANET users, creating what became known as the Internet.[27]

After 1975 computer-mediated communication became a "convivial tool" available to members of the general public who owned the latest technological gadget, a personal computer.[28] Hobbyist clubs such as the famous Homebrew Computer Club put their computers to use keeping up with other hobbyists through accounts with firms offering time-sharing services.[29] Within a couple of years, this activity shifted to bulletin boards run on individual computers.

In 1978, the first hobbyist computer bulletin board was available in Chicago using a personal computer and a home phone line. It is estimated today that more than 32,000 hobbyist bulletin boards are operated today in the United States.[30] Beginning in the 1980s, many bulletin boards became linked into networks large (such as FidoNet with more

than 2,500 boards) and small (such as Gaycom with about 20 boards).[31]

At the same time "information utilities," in which computer-mediated communication was one of the core activities, were being marketed to personal computer users of services such as Delphi, the Source, CompuServe, and GEnie.[32]

CompuServe Information Services, whose corporate roots are in the time-sharing business, launched MicroNET in 1979, after doing research of the European videotext services. Initially offered free to the 1,200 members of the Midwest Affiliation of Computer Clubs, CompuServe by 1980, had 2,500 subscribers. This grew to 10,000 by 1981; 100,000 by 1984; 500,000 by 1989, and 940,00 by 1991.[33]

The result of all of these developments in the short span of 25 years is a complex weave of computer networks-- many interconnected to span the globe, but just as many limited in scope--labeled by various observers as "the matrix," "Worldnet," or simply "the Net." Through these networks, millions of people have overcome not insignificant technological obstacles to engage in computer-mediated communication for purposes ranging from advancing knowledge and advancing political agendas, to making deals and making friends. As one librarian noted in 1990, "Computer networks are no longer just for computer scientists and hackers."[34]

Significance of Computer-Mediated Communication to Journalism and Mass Communication Professionals

Knowledge of and facility with computer-mediated communication is becoming a requirement for the computer literate professional of the 1990s because computer-mediated communication is becoming increasingly adopted by media organizations (as by other business organizations) and is being diffused among media professionals (as among other professionals) along with other forms of information technology such as word processing, spreadsheets, databases, expert systems, decision support systems, etc. For example:

* Media companies are among those firms supplying computer-mediated communication services in the market;[35]

* News, public relations and advertising organizations are adopting computer-mediated communication as a means of internal coordination;[36]

* Computer-mediated communication has become an increasingly important means of networking and professional development for professionals;[37]

* Journalists are using computer-mediated communication as a means of information-gathering;[38]

* Computer-mediated communication has relevance for advertising professionals as a means of communicating with clients;[39]

* Among the uses public relations professionals are finding for computer-mediated communication are corporate

communications, transmittal of news releases, and management
of crisis communication programs.[40]

These developments suggest it is time journalism and
mass communication educators determine a strategy for giving
students an understanding of computer-mediated
communication.

Teaching Computer-Mediated Communication

The typical reaction of journalism educators to
arguments that yet another computer application must be
squeezed into an already tight curriculum is resistance.
But there are special circumstances in journalism education
today that suggest educators should try to give students as
broad an education possible in the applications of computers
in professional work.

Demographic surveys of journalism students have shown
for some years that the majority of majors are women.[41] It
has been argued that women, due to persistent socialization
that technology and mathematics are the province of men, are
less likely to achieve computer literacy than men.[42] In a
computer-driven industry such as the mass media, being
unskilled in computer applications is no small handicap.
However, educators can help empower their students become
functionally literate with computers by incorporating
computer applications of all kinds into journalism
education. As Judy Smith wrote:[43]

> Literacy is an empowerment tool for the
> disenfranchised; that's why so many Third World

liberation groups have literacy campaigns.
Computer literacy can be the same type of
liberating force for women in a technological
society. Computers can give women an opportunity
to manage technology: to gain a new competence in
an area where many women are reluctant to enter.

If it is agreed that computer-mediated communication is

a computer application worthy of journalism and mass

communication professionals' acquaintance, survey data on

user demographics suggest that computer-mediated

communication especially should be incorporated in some

fashion into the curriculum as women are an extremely small

minority of present online communities.[44]

It is our aim to advance the idea that the pedagogic

promise that some educators have already seen in computer-

mediated communication can be extended effectively into many

areas of the journalism and mass communication curriculum.[45]

Toward this end, we outline two general approaches

toward the pedagogic use of computer-mediated communication.

The first approach is to adopt computer-mediated

communication in every course as a supplemental means of

student-professor and student-student communication. The

second approach is to target some core courses in the

curriculum where the introduction of computer-mediated

communication not only would facilitate communication with

and among students, but also could serve to enhance the

instruction of a number of topics already addressed in

various courses in the curriculum.

Class Communication Approach

The premise behind the first approach is already widely accepted in journalism and mass communication education: each course in the curriculum should contribute in multiple ways to the development of students' professional skill. One example of this premise is the requirement that even if the course is journalism history the written work submitted should meet the minimum professional standards of accuracy, clarity, brevity and punctuality. Thus, any and every course might be tapped as an opportunity to give students experience with computer-mediated communication by establishing it as a means for communication between student and professor and among students, and by encouraging its use through incentives such as extra-credit points or through required assignments.

Besides giving students an orientation to the phenomenon of computer-mediated communication, our experiences suggest that adopting e-mail and bulletin boards as a mode of classroom communication provides benefits similar to those discovered in the business environment.

The introduction of computer-mediated communication has been shown to result in increased communication, particularly between those in different levels of the organizational hierarchy.[46] Such a hierarchy describes the typical relationship between students and instructors in a large lecture class. One author who put an introduction to

the media course with more than 150 students online found
computer-mediated communication helped overcome the limits
of face-to-face communication in the large lecture setting.
In the beginning of the term, several students used their e-
mail connection to issue an ironic critique about the poor
learning conditions in a class of that size by engaging the
instructor in a "guess who I am" game, sending a new clue
via e-mail before each class session. Over the course of
the term, critical comments on lectures, jokes, advising
questions, requests for appointments, apologies for
absences, and the occasional cries from a young adult in
existential crisis, were sent from a good cross-section of
the students. Far-ranging dialogues developed between the
instructor and a core group of e-mailers. In general,
students were enthusiastic about having e-mail as an
alternative to crowding around the instructor at the podium,
waiting in a long line at office hours, or playing telephone
tag.[47]

The introduction of computer-mediated communication in
business organizations also has been shown to foster
efficiency in team work situations "by providing people with
a 'place' to meet whenever necessary and a way to access
common files."[48] Another author, who used e-mail and an
electronic bulletin board in a television news reporting
class to communicate with students about story assignments,
upcoming events of interest, and general class management
issues, found that the technology was particularly helpful

for students to communicate with one another about scheduling camera gear or helping on story shoots. For example, if a student working on a story needed a photographer, he or she could place the request for assistance on the class board.

Computer-mediated communication has proven useful in the business environment in facilitating problem-solving among colleagues.[49] One of the authors uses e-mail to facilitate peer evaluation of student news stories. Previously, accomplishing this goal required cumbersome coordination of photocopied texts. Now, a document can be sent through electronic mail to all classmates or a selected group of classmates by invoking a simple send command. The classmates can then edit the document and electronically return the new version to the student author as a mail reply.

Computer-mediated communication also has been shown to be an excellent tool in business organizations for people who have trouble expressing themselves or being understood in face-to-face situations.[50] Included among this group may be the very shy; people who cry easily when they are upset and are embarrassed by this; people with disabilities that affect their speech; and non-native speakers who are not fluent English conversationalists. Adopting computer-mediated communication as a medium of student-faculty communication and class interaction may provide liberating options for some students because it gives them more control

over their messages than they have in face-to-face
encounters.

Topic Illustration Approach

The introduction of computer-mediated communication can
serve as a useful means of communication in any class. But
in some courses it can serve an additional pedagogic
function by illustrating topics that are being introduced
into the journalism and mass communication curriculum in
light of the diffusion of computer-mediated communication in
society.

Introduction to the Media

It has become commonplace for textbooks for media
survey courses to devote some attention to computer-mediated
communication as part of an overview of future trends.[51]
This is a topic that students without computer-mediated
communication experience often find difficult to grasp.[52]
As Hiltz and Turoff noted, "Just as it would be difficult to
explain to someone who has never observed or participated in
a face-to-face discussion or decision-making group the
communications processes and social dynamics involved, so
the best way to learn about computerized conferencing is to
participate."[53]

Hands-on experience with e-mail and a bulletin board,
and ideally a demonstration of an electronic information
delivery service, would give students the same level of
context for readings on computer-mediated communication that

they bring to the readings for newspapers, magazines, radio,
television, etc.

Media Law

The leading textbooks in media law have yet to address
the issues that are emerging with respect to computer-
mediated communication. Among the issues are free speech
rights and the application of libel,[54] privacy,[55] and
obscenity[56] laws.

The long-standing free speech debate has been framed
not only by traditional First Amendment theory,[57] but also
by what has been termed the "Hacker Ethic."[58] A specific
controversy that has emerged in the debate is whether
computer forums should be considered "electronic analogues
to the parks and streets,"[59] or whether "system operators"
of bulletin boards or "moderators" of conferences should
have "editorial discretion" with respect to other
participants' messages.[60] One significant development in
the electronic free speech debate was the formation in 1990
of a civil liberties group, the Electronic Frontier
Foundation, whose goal is to "preserve, protect, and extend
Constitutional rights to the realm of computing and
telecommunications technology."[61]

Putting students online to study the importance of the
communication that is at stake in the legal debate about
electronic free speech rights would provide a basis for a
more informed discussion of this important issue.

Reporting

Exposing students to different techniques of information gathering is one of the traditional tasks of reporting. This includes such prosaic topics as how to organize a notebook or present one's self on the telephone and more glamorous topics such as how to mine public records or search databases.

Along these lines, computer-mediated communication could be introduced as a means of "interviewing."[62] Students' interest might be piqued by first reading a selection of journalistic pieces that involved information gathering via e-mail and bulletin boards.[63] Then, they could be assigned a story that would require their utilizing the technique. An idea appropriate for beginning students would be to assign students to interview selected faculty across the university about how the new information technologies have changed their work.

Mass Media and Society

The expanding use of computer-mediated communication among Americans is a phenomenon with social and political significance that textbooks for courses in mass media and society are beginning to address both because of attention given the topic in the media and a growing body of research.[64]

The most common issue to be addressed concerns political communication. Does computer-mediated

communication foster a more democratic society by providing a new outlet for discussion and mobilization among citizens? Or does it undermine democracy by enhancing the power of elites through the widening of the information gap, and by increasing the opportunities for "big brother" surveillance?

Discussion of such issues would be enriched by projects that engage students in direct examination of the phenomenon of computer-mediated political communication. One approach would be to adapt some of the questions posed in research articles about computer-mediated communication for class projects. Ogan's content analysis of the messages on a BITNET mailing list for Turkish expatriates during the first four weeks of the Gulf Crisis in 1991 could serve as one model.[65]

Media Management

A major theme in media management is the blurring between print and electronic media that is occurring with the rise of new communication technologies.[66]
One way the lines is blurring is through newspapers' launching of electronic services that combine information delivery, bulletin boards and e-mail capabilities.[67]

Students could be grouped into teams to develop a feasibility study for computer-mediated communication services to be offered by the local newspaper. A requirement of the project could be that there may be only a

certain number of face-to-face team meetings and that all
other group communication should be via e-mail.

Practical Considerations: Some Tips

The logistics of putting a class online must be
carefully considered. In this section we present some
general points to consider drawn from the authors'
experiences working both with local area and academic wide
area networks.

Incorporating computer-mediated communication for the
first time may require up to a term's headstart. Many
details will have to be discussed with various technical and
administrative personnel within the instructor's department
and at the campus computing center. At a typical school,
two approaches are available for getting students online:
students may individually sign up for accounts on the host
mainframe, or the instructor may seek a temporary project
account for a course.

With a project account, an instructor may request a
bulk number of accounts in advance of the first class
meeting. At the first class meeting, the instructor
coordinates the assignment of individual students to
accounts and the creation of individual passwords. The
instructor would then send this information back to the
computing center for entry and can keep a copy to compile a
master list of student names, computer addresses, and
initial passwords.

Several advantages exist to signing up students via a project account rather than having them individually go to the computing center. First, students do not have to stand in yet another line; this increases the chances of getting everyone in the class on the system. Second, it is probably the quickest way to get students on the system, as course projects typically receive priority for posting. Third, complete records simplify troubleshooting for students who cannot log on, identifying "unsigned" messages and tracking down harassers. Students should be encouraged, however, to change their passwords once they have successfully logged on several times in order to protect their privacy.

Introducing a bulletin board into a course typically may require a separate set of negotiations with computer center personnel. A typical university system is interconnected with several wide area networks as well as local area networks. Students who are able to e-mail can participate in most of the bulletin boards on both the wide area and local area networks (with the caveat that posting on an international bulletin board system such as USENET will quickly deplete computer funds).

But a much more dynamic way to use bulletin boards is to request a course-only bulletin board on the university's local network (sometimes called "electronic classrooms"). When the computing center creates the bulletin board, the instructor can ask to be programmed as the board moderator.

Moderator status allows the instructor to limit access to class members only, and to delete any messages, if desired.

The most time-consuming task awaiting the instructor, however, is developing a student guide for the e-mail and bulletin board technology. A complete guide, which may run between five and eight pages, single-spaced, should include the following information tailored to your university's system:

a) how to write a password and how to rewrite it;

b) where to e-mail on campus, including details on whether special passes are needed and the cost of the passes;

c) how to log on to the host mainframe from each of the machines in the different locations on campus and by a modem-equipped personal computer;

d) how to access e-mail and the bulletin board;

e) how to read and send messages on e-mail and read and post bulletin board messages;

f) how to log off;

g) e-mail and bulletin board "etiquette."[68]

Educators should be prepared to deal with some pockets of resistance in learning this new computer application. In our experience, there are a large number of students who are very uncomfortable with computers. Special measures are called for to get such students off to a good start. For example, one of the authors invited any student who had one unsuccessful log-in inexperience to come during office hours

for a quick one-on-one tutorial. To make the manual seem
less intimidating, a series of simple exercises for the
different skills was devised. Another approach would be to
ask students experienced with e-mail and bulletin boards if
they would make themselves available at a designated hour at
the computing center and provide tutorials for their
classmates.

Educators should also try to leverage the enthusiasm
that many students will have for learning about computer-
mediated communication. Providing a reading list of popular
press articles about computer-mediated communications with
special reference to their use in journalism and mass
communication professions is one suggestion. Another is to
include a directory of e-mail addresses for departmental
faculty and other university officials, if available. In
the packet given by one of the authors, a photocopy of an ad
run in the student newspaper by the president of the
university publicizing his e-mail address and inviting
correspondence from students, faculty and staff, generated
considerable enthusiasm among students.

Perhaps more critical in motivating usage of computer-
mediated communication is for the instructor to provide
incentives for students to use it. One author sent twice-a-
week mailings to all students, and answered all personal e-
mail promptly to show that it was a useful medium for
communication. Extra credit was awarded for participation
in discussions on the class bulletin board, and if

particularly interesting dialogues took place, mention was made in class. In addition, the instructor required one short assignment to be e-mailed during the term.

Conclusion

More than 20 years has passed since the introduction of computers to journalism education. Despite initial resistance, many journalism programs incorporate the use of computer technology in courses, particularly in reporting, writing and editing courses. As we approach a new century, journalism educators must now take the next step, and, as Byron Scott has argued, provide journalism students with the knowledge of how to use the computer as a tool for interpersonal communications.[69] We believe that if journalism educators are going to teach that lesson, they must take two steps.

First, educators must continue to find ways to overcome initial resistance to the computer-mediated communication, both among students and colleagues. They must become familiar with the computer-mediated communication, a process increasingly underway among AEJMC members through exchange of e-mail correspondence with journal editors and colleagues, participation in electronic forums, publication of e-mail addresses in the AEJMC directory, the development of online academic journals, and increased interest in research in computer-mediated communication.

The second step is to locate niches in the curriculum in which computer-mediated communication could be usefully integrated. We have attempted to contribute to this second step by suggesting strategies that would exploit the pedagogic usefulness of computer-mediated communication.

Using the computer as a communication tool in the classroom can be painstakingly hard work, especially at the outset of a course. Students who are not computer literate may not only resist the computer-mediated communication, but also the computer altogether. Simple, required exercises, however, can go a long way toward overcoming the resistance and demonstrating to students that using the computer as a communication tool can enhance interpersonal relationships with both the instructor and other students.

Once the instructor has established the importance of computer-mediated communication and has created an environment where students feel comfortable using it, the possibilities for its use as a teaching tool seem limitless. The technology offers an opportunity for educators to take learning outside our experiences and the four walls of a classroom: It creates chances for students to participate in continual open dialogue and to receive constant feedback. Perhaps most significantly it allows exploration of critical social and legal issues that face a world increasingly reliant on the very technology itself.

Notes

1. John J. Clarke, "It's No Time for Clinging to Goose Quills," _Journalism Educator_ 30 (April 1975): 4; Murvin H. Perry, "How Kent State U. Copes With Problem of Costly Technology," _Journalism Educator_ 30 (July 1975): 44-45; Ray E. Hiebert, "J-education at Maryland," _Journalism Educator_ 31 (July 1976): 14.

2. Jon Roosenraad, "Amid CRT Revolution: Keep Those Old Glue Pots," _Journalism Educator_ 28 (July 1973): 48-49.

3. David Burnham, _The Rise of the Computer State_ (New York: Random House, 1983).

4. Jerry J. Berman, "The Right to Know: Public Access to Electronic Information," _New Directions in Telecommunications Policy_, ed. Paula R. Newberg (Durham, N.C.: Duke University Press, 1989), vol. 2, pp. 39-69.

5. Jae-won Lee, "Precision Journalism," _Journalism Educator_ 31 (July 1976): 5; William R. Oates, "Educators' Role Changed by Media and Databases," _Journalism Educator_ 40 (Autumn 1985): 42; Tim Miller, "The Data Base Revolution," _Columbia Journalism Review_ 27 (September/October, 1988): 35-38.

6. Marion Marzolf, "Patient Computer Relieves Writing Instructor's Tedium," _Journalism Educator_ 26 (Fall 1971): 2, 4-5. Also see Ralph R. Behnke and Paul E. King, "Computer Eases Teacher Workload in Writing Course," _Journalism Educator_ 40 (Winter 1986): 26-28.

7. Michael Sewell, "Five Computer Experiments Have Classroom Implications," _Journalism Educator_ 32 (July 1977): 7-8; Ron Smith, "Students Learn VDT Operation, Improve Grammar at Same Time," _Journalism Educator_ 37 (Spring 1982): 42-43.

8. William Edward Smith, "News Writing Students Prefer Computer Simulations," _Journalism Educator_ 45 (Summer 1990): 38-44; Gale Wiley, "Software&...," _Journalism Educator_ 45 (Summer 1990): 87-88.

9. In our literature search, fewer than a half-dozen direct and indirect references to computer-mediated communication in journalism and mass communication were located.

10. American publishers who experimented with videotext in the early 1980s deliberately excluded the communication features that had made videotext popular in France

after it was observed that most of the conversations were about sex. See Frederick Williams, "Network Information Services as a New Public Medium," <u>Media Studies Journal</u> 5 (Fall 1991): 148; Jean-Marie Charon, "Videotex: From Interaction to Communication," <u>Media, Culture and Society</u> 9 (1987): 301-32; Stewart Brand, <u>The Media Lab: Inventing the Future at MIT</u> (New York: Viking Penguin, 1987), pp. 25-26.

11. The diffusion of computer-mediated communication in American society is detailed in a later section.

12. As late as 1986 it was observed that "communication educators have been noteworthy by their absence from the world of computers, information utilities and telecommunications." See E.W. Brody, "AEJMC Members Urged to Use New CompuServe SIG," <u>Journalism Educator</u> 41 (Summer 1986): 29-31; Elliott S. Parker, "Computer Conferencing Offers Boundless Geography, Time," <u>Journalism Educator</u> 45 (Winter 1991): 49-55.

13. Computer-mediated communication is distinguished from computer-assisted information retrieval, such as searches of online data bases, and from computer-assisted transactions such as ordering an airline ticket or doing electronic banking.

14. Joseph R. Dominick, <u>The Dynamics of Mass Communication</u> 3rd ed. (New York: McGraw-Hill, 1990), pp. 11-15.

15. Elaine B. Kerr and Starr Roxanne Hiltz, <u>Computer-Mediated Computer Systems: Status and Evaluation</u> (New York: Academic Press, 1982), p. ix.

16. Denis McQuail, "Is Media Theory Adequate to the Challenge of New Communications Technologies," in <u>New Communication Technologies and the Public Interest</u>, ed. Marjorie Ferguson (Beverly Hills: Sage, 1986), p. 6.

17. The variety of forms of computer-mediated communication are exhaustively detailed in John S. Quarterman, <u>The Matrix: Computer Networks and Conferencing Systems Worldwide</u> (Bedford, Mass.: Digital Press, 1990), and Matthew J. Rapaport, <u>Computer Mediated Communications</u> (New York: John Wiley & Sons, 1991).

18. Libby Trudell with Janet Bruman and Dennis Oliver, <u>Options for Electronic Mail</u> (White Plains, N.Y.: Knowledge Industry Publications, 1984), p. 46; Steven Levy, <u>Hackers</u> (New York: Dell Publishing, 1984), p. 247; Rapaport, <u>Computer Mediated Communications</u>, p. 1; Peter J. Denning, "The ARPANET After Twenty Years," in <u>Computers Under Attack: Intruders, Worms, and Viruses,</u>

ed. Peter J. Denning (Reading, Mass.: Addison-Wesley Publishing Co., 1990), p. 12.

19. Deborah L. Estrin, "Inter-Organizational Networks: Stringing Wires Across Administrative Boundaries," in Policy Research in Telecommunications, ed. Vincent Mosco (Norwood, N.J.: Ablex Publishing Corp., 1984), p. 269.

20. Denning, "ARPANET," p. 13.

21. Douglas Comer, "The Computer Science Research Network CSNET: A History and Status Report," Communications of the ACM 26 (October 1983): 747-753; Katie Hafner and John Markoff, Cyberpunk: Outlaws and Hackers on the Computer Frontier (New York: Simon & Schuster, 1991), pp. 278-279.

22. Guy L. Steele, Jr., "Confessions of a Happy Hacker," in Eric Raymond, ed. The New Hacker's Dictionary (Cambridge, Mass: MIT Press, 1991), p. xiii; Sherry Turkle, The Second Self: Computers and the Human Spirit (New York: Simon & Schuster, 1984), pp. 222-223.

23. Thomas B. Cross and Marjorie B. Raizman, Networking: An Electronic Mail Handbook (Glenview, Ill.: Scott, Foresman and Co., 1986), p. 22.

24. Starr Roxanne Hiltz and Murray Turoff, The Network Nation (Reading, Mass.: Addison-Wesley Publishing Co., 1978), pp. 46-63.

25. Brad Schultz, "The Evolution of ARPANET," Datamation 34 (August 1, 1988): 73. Most of the other firms which followed in subsequent years in offering computer-mediated communication services to businesses, and later, to the general public, were either players in the telecommunications industry--Western Union, AT&T, ITT, MCI, GTE, etc.--or in the time-sharing industry--General Electric, Tymshare, CompuServe, Source Telecomputing, etc. (See Trudell et al., Options for E-Mail, pp. 57-61).

26. John S. Quarterman and Josiah C. Hoskins, "Notable Computer Networks," in Denning, ed. Computers Under Attack, pp. 55-60.

27. Quarterman, The Matrix, pp. 277-345. The Internet, a "network of networks," is comprised of more than 5,000 networks across 26 countries with more than 3 million users (Beverly T. Watkins, "New Group to Promote Internet's Role in Global Computer Networking," The Chronicle of Higher Education (September 11, 1991): A25). The backbone of the Internet today is the CSNET

(Computer Science Network) and NSFNET (National Science Foundation Network). The ARPANET was shut down in 1989 because it was technologically obsolete for research purposes (Schultz, "Evolution," pp. 71, 73).

28. For a concise history of the development of the PC, see Levy, Hackers, pp. 155-278.

29. Levy, Hackers, p. 247.

30. "Who Produced the First Published BBS List?" Boardwatch 5 (June 1991): 32; Michael W. Miller, "A New Medium: Bulletin Boards Become a Major Means of Communication," The Wall Street Journal (October 21, 1991): R8; Rick Lembree, "So You Want to Be a Sysop," Compute 13: (March 1991): G7-G14.

31. Quarterman, The Matrix, p. 254; Miller, "New Medium," R8.

32. For an overview of the information utilities still in business today, see Michael A. Banks, "Online Service Sampler," in "Online Communities," a special insert in Compute 13 (October 1991): 10-15.

33. Carole House Gerber, "Online Yesterday, Today and Tomorrow," Online Today 8 July 1989): 15, 18; Evan I. Schwartz, "Putting the PC into Politics," Business Week (March 16, 1992): 112.

34. Quoted in Caroline R. Arms, "Using the National Networks: BITNET and the Internet," ONLINE 14 (September 1990): 24.

35. For example, the Whole Earth Review offers the popular WELL conferencing system, and the Utne Reader organized an electronic salon on PeaceNet; some newspapers are bundling electronic information delivery with computer-mediated communication services, such as the Fort Worth Star-Telegram, or sponsoring bulletin boards, such as the Middlesex News of Framingham, Mass.; computer magazines have long sponsored forums for readers on information utilities such as CompuServe, GEnie and America Online, and the BIX service originally was started to cater to readers of BYTE magazine; the Reader's Digest Association operated the Source in the 1980s; and CBS was one of the investors for the project that became the information utility Prodigy, until it pulled out in 1987.

36. The following articles highlight uses of computer-mediated communication in media organizations: Gib Johnson, "The Compleat Reporter," Washington Journalism Review 12 (May 1990): 16-19; John Pavlik and Mark

Thalhimer, "The Charge of the E-Mail Brigade: News
Technology Comes of Age," in The Media at War: The
Press and the Persian Gulf, ed. Everette E. Dennis et
al. (New York: Gannett Foundation Media Center, 1991),
pp. 34-35; Cathy Madison, "E-Mail Erases the Paper
Trail at Agencies," ADWEEK 31 (November 12, 1990): 46;
Thomas Winship, "The New Curmudgeon," Editor &
Publisher 124 (August 3, 1991): 3; Jerome Aumente, "New
PCs Revolutionize The Newsroom," Washington Journalism
Review 11 (April 1989): 39-42; Richard C. L'Amie, "The
Computerization of Television Newsrooms," Paper
Presented at AEJMC Convention, Boston, Mass., August
1991.

37. Miller, "New Medium," R8. For example, among the
forums on CompuServe are those for broadcast
professionals, journalists and public relations
practitioners. Brad Schepp and Debra Schepp, The
Complete Guide to CompuServe (Berkeley: Osborne McGraw-
Hill, 1990), pp. 154, 156.

38. See discussion in Jerome Aumente, "The New Wave of
Computer Information Services," Washington Journalism
Review 10 (November 1988): 45; Phil Bailey,
"Professionals Online," BBS Callers Digest 3 (March
1992): 8-9; Mark S. Leff, "Phoning for Facts Doesn't
Mean Dialing for Dollars," The Quill 78 (April 1990):
38-40; Michael W. Miller, "Computer Magazines'
Electronic Spinoffs Give Readers a Quick Way to Talk
Back," The Wall Street Journal (October 19, 1988).

39. Tom Richman, "Fast Talk," Inc. 11 (December 1989): 181-
182; Madison, "E-Mail Erases," p. 46.

40. Karen Matthes, "The High-Tech Innovator at Work,"
Management Review 80 (September 1991): 20-21; Douglas
C. Traub, "Getting Online -- And Out of the Dust,"
Public Relations Journal 42 (May 1986): 7-9; Linda Jo
Calloway, "Survival of the Fastest: Information
Technology and Corporate Crises," Public Relations
Review 17 (Spring 1991): 85-92.

41. The latest data show 61 percent of journalism school
enrollees are female. See Lee B. Becker, "Annual
Enrollment Census: Comparisons and Projections,"
Journalism Educator 46 (Autumn 1991): 57.

42. See Sherry Turkle, "Computational Reticence: Why Women
Fear the Intimate Machine," pp. 41-61, and Judy Smith
and Ellen Balka, "Chatting on a Feminist Computer
Network," pp. 82-97, in Cheris Kramarae, ed. Technology
and Women's Voices: Keeping in Touch (New York:
Routledge & Kegan Paul, 1988).

43. Smith and Balka, "Chatting," p. 88.

44. User demographics reported for the major information utilities show the percentage of male users as between 85 and 95 percent See Frederick Matos, "Information Services," in NTIA Telecom 2000: Charting the Course for a New Century (Washington, D.C.: U.S. Government Printing Office, 1988), pp. 414-418. Those who are familiar with the world of hobbyist bulletin boards also have observed that there are very few women online See George Campbell, "How To Be a Good BBS Citizen," Compute 13 (March 1991):82.

45. We located only one article on applications of computer-mediated communication in journalism education, Thom Lieb, "Computer Conferencing Offers New Way to Think About Writing," Journalism Educator 45 (Summer 1990): 32-37. While it is impossible to review the literature here, educators in other professional programs, such as in education and business, have explored the possibilities more extensively.

46. Sara Kiesler, "The Hidden Messages in Computer Networks," Harvard Business Review 64 (January-February 1986): 46-48, 52-54, 58-60; Soshana Zuboff, In the Age of the Smart Machine (New York: Basic Books, 1988), p. 367.

47. In an extra credit assignment students, appointed members of a mythical committee on campus computing, were asked to propose how e-mail could be used on campus to better the student's lot. At least one third of the class proposed an application aimed at ending the frustration involved in getting in touch with their professors.

48. Cross and Raizman, Networking, p. 13.

49. Duboff, Age of Smart Machine, pp. 367-368.

50. Kiesler, "Hidden Messages," p. 58; Duboff, Age of Smart Machine, pp. 370-371.

51. For example, Dominick, Dynamics of Mass Communication, pp. 11-15; Conrad C. Fink, Inside the Media (New York: Longman, 1990), pp. 171-175; John R. Bittner, Mass Communication: An Introduction, 5th ed. (Englewood Cliffs, N.J.: Prentice-Hall, 1989), pp. 276-278; Edward Jay Whetmore, Mediamerica, 4th ed. (Belmont, Ca.: Wadsworth Publishing Co., 1989), pp. 385-387.

52. Researchers who attempted to survey the general public about their interest in politically oriented computer-mediated communication reported that people who were

less familiar with computers had difficulty
understanding the concept. See: Gina M. Garramone,
Allen C. Harris and Gary Pizante, "Predictors of
Motivation to Use Computer-Mediated Political
Communication Systems," Journal of Broadcasting &
Electronic Media 30 (Fall 1986): 454.

53.   Hiltz and Turoff, Network Nation, p. 7.

54.   Cubby Inc. v. CompuServe Inc. (1991), 19 Med. L. Rptr.,
      1525; J.W. Huttig Jr., "Online Ethics: Bulletin Boards
      Weigh Legal, Social Dilemmas," PC Today 6 (January
      1992): 42-43.

55.   Glenn Rifkin, "Do Employees Have A Right To Electronic
      Privacy?" The New York Times (December 8, 1991): F8;
      Christine Casatelli, "Setting Ground Rules for
      Privacy," Computerworld 25 (March 18, 1991): 47-48.

56.   Christopher Lindquist, "'Child Porn Sent on America On-
      Line: Transmissions Raises Censorship, Liability Issues
      for Nervous Bulletin Board Owners," Computerworld 25
      (December 9, 1991): 7; Lance Rose, "A Porn Sighting in
      Cyperspace," Boardwatch 6 (January/February 1992): 31.

57.   Ithiel de Sola Pool's Technologies of Freedom
      (Cambridge, Mass.: Belknap Press, 1983) presents this
      argument.

58.   Levy, Hackers, pp. 39-49.

59.   Charles M. Firestone, "Merging Mass Media, the
      Marketplace, and the First Amendment: Quantifying the
      Public Interest Standard," in Policy Research in
      Telecommunications, Mosco, ed., p. 306.

60.   Typically, "sysops" and moderators have been perceived
      as being in a benign "information management" role.
      See Starr Roxanne Hiltz and Murray Turoff, "Structuring
      Computer-Mediated Communication Systems to Avoid
      Information Overload," Communications of the ACM 28
      (July 1985): 685-687; Quarterman and Hoskins, "Notable
      Networks," p. 69; Charles Bowen and David Peyton, How
      to Get the Most Out of CompuServe, 4th ed. (New York:
      Bantam Books, 1989), p. 190. But some recent incidents
      on the Prodigy system have cast such editing in a new
      light. See Paul B. Carroll, "Prodigy Electronic
      Network Faces Controversy Over Censorship Issue," The
      Wall Street Journal (November 2, 1990), p. B4; Jack
      Rickard, "Prodigy Can't Win as a Censor," Computerworld
      25 (November 11, 1991): pp. 25-26. Until the legal
      situation regarding sysops' liability for posted
      messages is clarified, it is predicted that more and
      more restrictive editing will be done by sysops fearful

of users posting obscene information or using the board
to criminally conspire. See Lance Rose, "Cyperspace
and the Legal Matrix: Laws or Confusion," <u>Boardwatch</u> 5
(June 1991): 27-31.

61. "Goals of the EFF," <u>Effector</u> 1 (March 1991):np. The
<u>Effector</u> is the newsletter of the Cambridge, Mass.,
based group. It also runs a conference on the WELL.
For the history of its founding, see Craig Bromberg,
"In Defense of Hackers," <u>The New York Times Magazine</u>
(April 21, 1991): 45-49.

62. Credit for this application idea goes to Byron Scott of
the University of Missouri who has used such an
exercise in a feature writing course.

63. For example: Michael W. Moore, "From the Fault Line,
Electronic Tales of a Quake's Fury," <u>The Wall Street
Journal</u> (October 19, 1989): A1 and jump; "Is Computer
Hacking a Crime?" <u>Harper's</u> 280(March 1990): 45-57; Paul
B. Carroll, "Computers Indicate Mood at Big Blue is
Practically Indigo," <u>The Wall Street Journal</u> (August 7,
1991): A1 and jump; Michael W. Miller and Paul Carroll,
"The Gulf War Gives Computer Buffs Use for Their
Machines," <u>The Wall Street Journal</u> (January 25, 1991):
A1 and jump.

64. Examples include Caren J. Deming and Samuel L. Becker,
<u>Media in Society: Readings in Mass Communication</u>
(Glenview, Ill.: Scott, Foresman and Company, 1988);
Arthur Asa Berger, <u>Media USA: Process and Effect</u>, 2nd
ed. (New York: Longman, 1991); John Downing, Ali
Mohammadi and Annabelle Sreberny-Mohammadi, <u>Questioning
the Media: A Critical Introduction</u> (Newbury Park: Sage,
1990); David Crowley and Paul Heyer, <u>Communication in
History: Technology, Culture, Society</u> (New York:
Longman, 1991).

65. Christine Ogan, "Far From Home in a Crisis: A Study of
Electronic Mail Communication of a Turkish Expatriate
Community During the Gulf War," a paper presented to
the Association for Education in Journalism and Mass
Communication, Boston, August 1991.

66. John M. Lavine and Daniel B. Wackman, <u>Managing Media
Organizations: Effective Leadership of the Media</u> (New
York: Longman, 1988), p. 19.

67. Doug Underwood, The Newspapers' Identity Crisis,"
<u>Columbia Journalism Review</u> 31 (March/April 1992): 24-
27; Joe Donth describes the Fort Worth <u>Star-Telegram</u>'s
"StarText" service in <u>Prototypes of the Future: How
Readers Look at Newspapers</u> (Washington, D.C.: ASNE
Foundation, 1990), pp. 85-86.

68. For example, not to write in all capital letters, how
    to signal a comment was meant in a joking manner,
    avoiding "flaming," etc. For a list of items to
    consider, see Campbell, "BBS Citizen," p. 82; Norman Z.
    Shapiro and Robert H. Anderson, <u>Towards an Ethics and
    Etiquette for Electronic Mail</u> (Santa Monica: The Rand
    Corp., 1985); Schepp and Schepp, <u>CompuServe</u>, pp. 170
    and 178. In addition, some universities have rules
    pertaining to offensive speech in their user manuals
    which should be called to the students' attention.

69. Quoted in "On-Line Computing," <u>The Computer Connection</u>
    (Syracuse: S.I. Newhouse School of Public
    Communications, 1989), p. 26.