

Exploring Alternative Categories of Users of Computer Communication Systems

Alejandra Rojo

Abstract: The purpose of this study was first to describe patterns of computer-mediated communication (CMC) usage by graduate students at the Ontario Institute for Studies in Education (OISE), and second to explore alternative ways of describing users of communication systems. A qualitative approach was thought adequate to the aim of describing patterns of CMC usage from the actors' perspective. Data were collected through a semistructured interview and processed according to the method of constant comparison. The main findings in this study are: 1) the coexistence of patterns of usage: the students interviewed used CMC for instrumental purposes and to make or keep social contact; and 2) these students' thwarted expectations regarding online conferencing. Similar findings for EIES, Minitel and ALEX are discussed. Dynamics of online communication are brought into explaining frustrated participation in online conferencing.

Resume: Les buts principaux de cette Etude sont: 1) la description de modeles de communication informatique mediatisee utilises par les etudiants diplomes à l'Ontario Institute for Studies in Education (OISE); et 2) l'exploration des moyens alternatifs pour decrire les utilisateurs de ces systemes de communication. Une façon qualitative fut, au debut, suffisante pour decrire les modeles d'utilisation des communications informatiques mediatisee suite aux perspectives des acteurs. Une entrevue semi-structure fut utilisee pour la ceuillette et le traitement de donnees selon la methode de comparaison constante. Les principaux resultats de cette etude sont: 1) la co-existence des modeles de manipulation: les etudiants impliquees dans une entrevue ont utilise la communication Informatique mediatisee pour atteindre les buts, et pour creer et retenir une relation sociales; et, 2) ces etudiants contrec arrent les attentes en ce qui concerne une conference en ligne. On discute les resultats semblaibles suite aux programmes EIES, Minitel et ALEX. Les dynamiques d'une communication en ligne sont utilisees pour expliquer la participation insatisfaisante d'une conference en ligne.

Dervin (1989) argues that traditional user categories employed by communication media researchers fail to provide a basis for innovative system design, and help to perpetuate current patterns of use and exposure. Traditional user categories are based on population segmentation; users are described demographically, psychologically and geographically, according to marketing principles. They are described in terms of "what they own, what they have access to, what they control, how they live, and what are they able to do, use, think" (Dervin, 1989, p.216). Developments then are targeted to people who are already able to access and use the current systems.

Some researchers have developed new ways of describing users that change the premises of communication system design. These approaches emphasize the actor's perspective rather than the observer's perspective, as is traditional. The change is from categories derived from transmission and objectivity-oriented models of communication to categories derived of situational-bound models of communication, focussing on the ways in which users construct information and perception of situations (Dervin, 1980).

The alternative categories proposed by Dervin (1989) are based on the assumption that the uses a person makes of an information or communication system arise from the intention to make meaning, to bridge gaps. These categories are grouped as follows: a) *the actor's situation* - categories designed to understand what in a given situation induces a person to use a communication system; b) *gaps in sense making* - categories designed to uncover gaps which the communicator is attempting to bridge; c) *actor-defined purpose* - categories that deal with the actor's purposes for using a communication system; d) *information-using strategy* - categories of strategies for seeking and using information; e) *information values* - categories designed to describe the users' criteria for evaluating information; f) *information traits* - the information characteristics which would match the users' needs.

Another useful approach to understanding users' needs is to study *lead users*. Von Hippel (1988) argues that for very novel and highly changing processes, products or services it is desirable to get input from those users

whose present needs will become general in a marketplace months or years in the future. Since lead users are familiar with conditions which lie in the future for most others, they can serve as a need-forecasting laboratory for marketing research. Moreover, since lead users often attempt to fill the need they experience, they can provide new product concept and design data as well (p. 387).

In North America, computer-mediated communication (CMC) has proliferated mainly in university and business environments. Thus, graduate student users in a graduate School of Education may be considered CMC lead users.

At the Ontario Institute for Studies in Education (OISE), electronic mail has been available since the beginning of the 1980's. The Participate (Parti) computer conferencing system -a VAX-based system - was acquired in 1985 and has been used mainly for delivery of courses. In fact, OISE was the first public educational institution in Canada to offer credit and non-credit courses entirely online, using Parti. Over two years ago, the system was opened so that any OISE user could initiate and moderate a conference. Although online communication is becoming increasingly integrated into OISE activities participation on CMC is still not massive. Presently*, one in four students

*Fall 1989.

from 2367 students) have VAX accounts. The number of registered names in Parti is approximately 776, including faculty, staff and students.

The purpose of this study is first to describe patterns of CMC usage by graduate students at the Ontario Institute for Studies in Education (OISE), and second, to explore alternative ways of describing users of communication systems.

METHODOLOGY

A qualitative approach was thought more appropriate to the aim of describing patterns of CMC usage from the actors' perspective. Data were collected through a semistructured interview and processed according to the method of constant comparison (Lincoln and Guba, 1985).

Subjects

The original plan was to examine graduate students using Parti for a specific course, but only one student in the course agreed to participate in the study. The recruitment was then changed to include students using Parti at will, as opposed to a mandatory basis, in an online course. Therefore a note was sent to the "El cafe" conference (a chat conference in OISE Parti). Nine students answered, agreeing to participate in the study. One male student, however, was eliminated because he could not be interviewed face-to-face, as he lived in Western Canada. Therefore, in total, nine students (five males and four females) were interviewed for 30-45 minutes.

The students' ages ranged between 27 to 40 (seven were in their mid thirties). All were single except one female student. They belonged to five different Departments at OISE. Three students were in the M.A. program; three in the M.Ed. program; two in the Ph.D. program and one in the Ed.D. program. They were in the last stages of their programs.

Measures

The interviews were based on this schedule:

- ⌘ When was the first time you heard about Parti?
- ⌘ How did you decide to start using Parti?
- ⌘ Did you have any preconceptions or imagery about Parti prior to using it?
- ⌘ What were your first impressions of Parti?
- ⌘ Have these impressions changed after using Parti for a while?
- ⌘ What was your experience with computers prior to using Parti?
- ⌘ Do you use E-mail?
- ⌘ Have you developed any routine to use Parti?
- ⌘ Do you compose on line or do you use a word processor and then upload?
- ⌘ What features of Parti do you use?

- ⌘ What do you use Parti, E-mail for?
- ⌘ What conferences have you joined?
- ⌘ What is your role in these conferences?
- ⌘ Have you thought of initiating a conference yourself?

DataProcessing

The taped interviews were processed as follows:

The first three interview were transcribed and coded according to broad categories which were employed later to code the rest of the interviews. These categories were

- ⌘ Awareness of Parti
- ⌘ Learning to use Parti
- Parti activities
- ⌘ Routines for CMC
- Roles in conferences
- ⌘ CMC as a pleasurable activity
- ⌘ Negative experiences with CMC
- ⌘ Comparison Parti - E-mail
- People's behavior

An examination of the units included in each category led to elaboration of new, finer categories.

- Keep in touch with people
- Make contact with people
- Feel connected
- Discuss an issue
- Send personal messages
- Send messages or files to professors
- Send messages outside OISE
- Ask for technical help
- Print
- Download/upload
- Open a conference
- Read conferences
- Demonstrate a skill or knowledge
- Keep track of what's happening
- Use as a toy, entertainment
- Network
- Special uses

Four dimensions emerged from the examination of these categories, mainly associated with Dervin's category of actor-defined purpose. They fit well with the above categorization and with the author's intuitive impressions while conducting the interviews:

- ≈ Instrumental use
 - ≈ Being socially immersed
- ≈ Exploratory use
 - ≈ Demonstrating skills or knowledge

RESULTS

Levels of Adoption of CMC

All students used E-mail and Parti except one of them who used only Parti as part of a mandatory course activity and who lived in the U.S. Four students had previous intensive experience with computers while the others had experience mainly with word processors. Students learned about Parti one or two years ago. Four students learned Parti by themselves "playing around" "figuring out" "experimenting" using the online Help; one learned in a CSG¹ workshop and the four remaining were introduced by an OISE professor as part of course activities. All claimed not to have used the manual, stating that the Help feature was enough: "Parti is a user-friendly program" 'you don't need a manual for everything.' Three have asked for help a few times from the 'Parti Assist' conference.

In terms of levels of adoption² this group seemed to have reached a plateau and developed certain routines at an elementary level. Only one student had tried to implement some procedures to make his use of CMC more efficient. Seven students check their mail (E-mail and Parti) every day. The other two, living out of Toronto, check it only a few times a week, because of the line charges. Usually they check E-mail first and then if they have time they read Parti messages. Personal messages are usually answered at once. All of the students log on regularly at least once a day; two of them log on 4-10 times a day. All students compose online, i.e., type directly the text of the message to be sent. They do not use Parti features that help text editing (e.g., the edit command) or the uploading files capability which allows text created in a word processor to be brought into the Parti environment. They state that: a) they do not need to make use of these features so they have not taken the time to learn; or b) they have learned these features but do not use them because they find them cumbersome.

¹Computing Services Group, OISE.

model of adoption of innovations is from G. E. Hall, cited by Naidu, 1988.

Four students had tried the PHONE facility (a synchronous chat facility). A few students occasionally do print dumping from the screen or from files transferred through E-mail. Only one student has made an online bibliographical search in FELIX, the online catalogue of the University of Toronto Library.

All are aware of the small number of students involved in CMC at OISE and see this as a disadvantage. They attribute this to the following reasons: people do not like computers, people have not had access to computers before, people are afraid to learn about computers or lack the time to learn, people do not have computers at home.

Patterns of CMC Usage

Two main patterns of CMC usage emerged. First, these students use CMC as a message device for instrumental purposes and second, these students use CMC as a contact device- to keep socially immersed. Two minor patterns also emerged: CMC as entertainment or exploratory activity and as a forum for demonstrating skills or knowledge.

CMC as a Message Device: Exchanging Information and Reaching Out

Students use Parti and E-mail to exchange information, arrangements, ask for technical help. Some prefer E-mail for this (because of easy access to past messages) some prefer Parti (because of the capability to check if the person has read the message). Students use E-mail to correspond with their supervisors and thesis committee members. Most of them have sent messages out of OISE, but only one does it on a regular basis. Some of them have occasionally sent files through E-mail. One of the interviewees organizing a conference made a call for papers through Parti.

These students have joined at least 4-6 public conferences in the system. Public conferences at OISE are mainly technical conferences, exchange of technical information about different programs, except the "El cafe" conference (a chat conference) and an issue-oriented conference. Some have had experiences with private conferences. Most students are only "observers" of conferences; they content themselves with browsing through messages. Some students occasionally respond to questions and few students have actively expressed viewpoints.

CMC as a Contact Device: Being Socially Immersed

Students state that they use Parti and E-mail as a way of making contact with people or keeping in touch. There is an emphasis on casual, informal communication. Six of them used Parti preferentially for this purpose. and three of them use E-mail for it. It is possible to distinguish various ways in which people get socially immersed:

- *feeling connected:* Some students in the last stages of their programs and without any concrete tie to OISE stated that using E-mail or Parti was a way of still feeling part of OISE: "it was exactly the time I stopped

working in an office, I stopped meeting people or talking to people and here there was a group of people conversing.. .I never wrote a message" "It's a feeling of still being connected to OISE now that I'm choosing to stay away as much as I can." Students that are living in special, isolated life situations feel comforted by their on-line contact: "If you are lonely sometimes it's kind of neat to have a message" "When I started I thought this is wonderful because being a foreign student.. .I still think that has a lot of possibilities" "It's nice when you feel kind of lonely," "If I have lots of time and I feel that I really need to make contact with somebody then I'll spend up to one hour, even if there are not messages on. I will read back messages and all kinds of things."

- *networking*: Students stated that CMC makes it possible to establish contact with people or keep in touch: "I like the fact that I can 'hit' people across the country or around the world," "I keep in touch with my friends," "I send notes just to say *hi* to colleagues I've met in that course." They also stated that CMC could allow them to establish a relation with people who have common interests, however, they also expressed some awareness of possible difficulties in achieving this purpose: "I have thought of opening a conference to play squash," "One thing I've been really tempted to do but I don't know how many people would be interested is to look at issues of parenting." One student had thought of starting an antiracist conference but stated ". . .it's difficult to get key people involved."
- *exchanging viewpoints*: Some of them see Parti as a forum where it would be possible to discuss issues (*see the section Expectations and Reality in Parti*).
- *knowing what it is going on*: A few express a vague need to know what is going on at OISE: "to keep track of what's happening" "to keep abreast of what's happening."
- *meeting people*: One student used Parti to meet people "In these days the singles situation is difficult" "you are certain that people have similar level (sic) and interests." Another one referred to the same issue in a humorous way "Not everybody is interested in having conversations with strangers, this is not a dating service."

Two students speak of a kind of *compulsive* log on behavior "Mostly I'm addicted to VAX mail. I tend to log on quite often, sometimes ten times a day "I keep in constant contact with over ten people that way, on a daily basis, I probably spend an hour and a half on the mail a day" "It doesn't bother me like going two or three times a day, nobody in the Department is complaining that I'm spending too much of the Department money on that so I don't hesitate to use it."

Two Minor patterns of CMC Usage

There were two other kinds of CMC usage: a) as entertainment or exploratory activity - "It's a distraction from working on my thesis" "Just to take a break" "It's personal entertainment" "I use it for curiosity...it's a kind of curiosity for what is going on" "As for example CoSy* every student has an account and you would always have somebody to talk to, to have some fun, here I don't know many people that are on so I'm sort of limited with the audience I can play with" and b) as a forum to demonstrate skills or knowledge: "I can demonstrate my expertise in a particular word processor" "I take it as a kind of public service."

EXPECTATIONS AND REALITY IN PARTI

Dialogue in Parti

Students expected a lot from Parti: "I liked the idea of a conference - the idea that you could discuss an issue through a computer." However they expressed disappointment in this respect; they complained about uninteresting content and the exchange of trivial banter: "I didn't find that the discussion, the idea of a conference, the material in there was all that interesting. It seemed to be a lot of communication in terms of what's the meeting about, what are you doing tomorrow as opposed to discussion of topics" "I found that really boring, I never found anything of interest there" "I use it now more for announcements, sometimes I expose my views." They were also unhappy with the lack of involvement and low participation of others: "There are lots of people who just sit and watch and you just can't force them to participate." "A lot of people are up to date according to the system, but have never written something, that's too bad. It would be harder to be that quiet in a real conference." "Nobody responds to anything." "If we were around the table it would be very hard for them to be that quiet."

A few users of Parti referred to the problem of feedback delay: "One of the issues I've tried to get used to is even the length of the messages because you don't know if you will get immediate feedback, you are not sure if you overloaded (sic) or it's too situation-specific...that kind of thing." Others mentioned the lack of feedback: "When I write something I may never receive any response, there is a sense of needing response." "I think it's one of the limitations of computer conferencing that some people are going to get responded to and simply others are not going to get responded to." It seemed easier to express a viewpoint than to respond to another person: "I usually throw in a thought of my own, rather than responding to what is already going on." Some students mentioned time as a factor in the decision to respond to others' messages: "I sent a message about that and people responded to that.. .

*Conference System developed by University of Guelph.

but I didn't have time to continue the dialog." "When something is crystallized in text it means you have more time to reflect upon on it and decide whether or not you are going to respond."

One of the interviewees opened a conference and described it in this way: "It's basically three or four of us who do most of the communication and every once in a while somebody else says something or somebody gets frustrated and complains *nothing* useful is going on here, there's no philosophical discussion going on here, why don't you start something...and they don't start anything." He has been playing his role of moderator very much as a social *host* (Feenberg, 1987), greeting and receiving new members, but he showed uneasiness about his *meeting chairperson* role: "I feel if I dominate the conference too much, it discourages other people from participating, so that's been a problem for me" "You don't know how much to have input" "I hoped that people who join would participate and initiate ideas, raise issues and prompt the rest of us to discuss them" "I hope other people than me would respond to these kinds of things."

Searching for a Pliable Social Reality?

There was some expectation of magical ease in making social contacts "Initially I felt a lot freer to contact people" "I thought it was more like a community, friendly people and everybody would feel comfortable like one big party." Only one student referred to the need for creating a common space for discussion and to the difficulty posed by the different "languages" of participants. A few students expressed a kind of expectant attitude, waiting for something to happen: "If I don't log on I can miss something important." "Next day something interesting will happen." However, some of the issues commonly conditioning inhibitions in face-to-face encounters are also playing a role in Parti encounters:

- *private us public* - "The conference is supposed to be a forum for sharing ideas.. I don't exchange ideas in a group situation even in a class situation." "I'm a very private person and I don't like to talk about issues like that publicly, I'm not willing to take that step." "There are some people that are always on and they are the best of friends and it's like you are interrupting a private conversation and I feel funny about that."
- *risk* - "You can put yourself into trouble if you say the wrong thing you look like a racist or you look like you are stupid." "On one occasion someone was asking information that I knew...I felt tempted to respond...but I thought it could sound presumptuous"
- *permanence of utterances* - "It's not only just fleeting but also something that really comes up as permanent record...I think that changes one's relationship to other people." "Maybe I should voice my opinion but then you don't want to feel like a jerk because it becomes public and remains."

DISCUSSION

The discussion will refer to findings and arguments of other researchers regarding the two main issues emerging from the present data: a) the coexistence of a sociability-oriented pattern of CMC usage with a rational-instrumental CMC usage and; b) users' thwarted expectations respect of online conferencing.

The Rational User and the Convivial User

On one hand, the students interviewed use CMC in an instrumental way: to correspond with their supervisors and thesis committee members, to exchange information, to arrange meetings and to ask ask for technical help. On the other hand, they use CMC also to get socially immersed – to feel connected, to network, to exchange viewpoints, to know what it is going on, to meet people, to entertain themselves. Similar coexistence of patterns of usage has been found in other online experiences. Hiltz (1984) describes groups of scientists using EIES* engaged in task-oriented activities as well as on a variety of social activities. This trend has also been described for the utilization of Minitel and ALEX. Minitel is an interactive videotext service initiated in France in 1978. ALEX is also an interactive videotext service that was first launched in Montreal in 1980 and in 1990 in Toronto.

In her study of online scientific communities, Hiltz (1986) found users involved in a) task-oriented activities such as communicating about theoretical and methodological controversies in their fields, and b) social activities: people “exchange gossip and pleasantries, support and comfort one another at times of personal crises, look for interesting activities online, flirt, and invent new forms and applications. Births, deaths, and marriages have been announced, and friendships formed” (p. 106).

Charon (1987) describes two patterns of user behavior for Minitel: the first one can be categorized as *utilitarian* and corresponds to a user who resorts to specific on-line services in an episodic, punctual, rational way: database consultations, bank transaction, train ticket reservations, information searches and so on. The second pattern corresponds to a user who searches mainly for *conviviality*, entertainment and who makes permanent, regular use of the network with a strong emotional and social investment. Initially, Minitel was aimed to increase access to information because the designers a priori conceived a model of user resembling French computer scientists in likes and attitudes. However, later, unexpectedly, the general public transformed the way in which the medium was utilized, emphasizing the communication among persons, among groups, among institutions. Already, in 1986, the online messaging and entertainment/leisure services had become the most prominent. The Montreal experience with ALEX seems to have followed a similar

*Electronic Information Exchange System, conferencing system based at the New Jersey Institute of Technology and designed by Murray Turoff.

pattern to the Minitel experience. The higher number of billable calls are by far Communications (chat and contact services) 19,012 and Entertainment/Leisure 4,046; then Finance 3,861, Consumer (includes Home Shopping and Public Utilities) 1,773; Current Events, 1,403 and then Government/Politics, 651; Food, 462; Tourism, 344 etc. (Bell Canada, 1989).

DYNAMICS OF ONLINE COMMUNICATION

The Passive Participation Problem

Despite their initial interest and hopes with respect to participating in online conferencing, most of these students have taken the role of passive observers. They seem to have expected an easy social contact in online interaction. Instead, they found, in others, a lack of involvement and participation and, in themselves, unwillingness to take the perceived risks and commit the time involved in making public written statements. Although the passive participation phenomenon in online interaction has been observed for several researchers there is no elaborations on its dynamics. Feenberg (1987) and Mason (1989) associate the passive participation phenomenon to the special characteristics of online communication process. Grint (1989) and Davie (1988) bring into focus the issue of the permanence of records.

In an evaluation of the use of CoSy in an Open University course, Mason (1989) found that in the main conference only 26% of all students were contributors. Mason hypothesizes that the lack of a clear model of how to participate deterred these students from participating actively. Feenberg (1987) asserts that the absence of tacit feedback in online interaction results in communication anxiety and reduces some participants to silence. Grint (1989), assessing participation and non-participation in CoSy in the same Open University course mentioned above makes the hypothesis that the indelibility of the written message (in contrast to the fleeting nature of oral contributions) leads to perception of a demand for a correct message. Davie (1988) comments on the issue of passive participation

the problem seems to lie in the perception that leaving a note in the conference is an act of publishing, rather than an act of speech. As a student confronts the issue for the first time (or maybe at any time) life scripts relating to significant other's reactions to one's written work are activated. We become overly concerned about how others will view our writing (p. 8).

The present author suggests that an added factor regulating online participation could be the familiarity of the user with a) CMC systems and the particular online experience. For a novice user of CMC systems or a participant involved in the first stages of an online conference, the lack of a model of how to participate and the communication anxiety derived from the absence of tacit feedback can be more prominent factors in inhibiting their

participation than the perceived demand for a *correct* message and the time involved in producing it. Instead for more experienced users the latter can be more important deterrents.

The Intermediary Role in Communication Systems

The students in this study expressed frustration over the lack of substance of the online dialogue in Parti. Students' complaints of *trivia* have been also reported for an Open University course using CoSy (Grint, 1989; Mason, 1989). Mason states that message exchanges were mostly geared to information giving or receiving rather than to more articulated forms of dialogue such as discussion, opinions, critiques. The need for a moderator, an intermediary in online communication, has been discussed by Feenberg (1987), Ancelin (1987) and Charon (1987).

Feenberg has described online communication as lacking on the tacit dimension, i.e., the tacit cues in our face-to-face encounters that give us information on the appropriate and relevant kind of communications for a certain context. He postulates that the contextualizing and monitoring functions in online communication can be fulfilled by the actions of a moderator. A moderator should provide context for online interactions and should monitor how the participants of this interaction are interpreting this context. Feenberg (1987) states, "In large part, this role will consist in reassuring participants that their contributions to the discussion really fit the model" (p. 179). Feenberg (1989) also considers it important for the moderator to perform meta-communication functions: communicating about the communication, The moderator should be able to help participants confronting communication problems openly, by requesting clarification, changing rules in the conference, and so on. It is also important that the moderator makes comments about the content of the conference - i.e., weaving comments. He or she should help to identify issues, make connections, point out the areas of disagreement, and synthesize. Ancelin (1987) predicts that the next generation of Minitel services will be *contextualized* services, that is to say, services with the intervention of intermediaries and *animateurs* (facilitators), organized around the participation of the users. Charon (1987) proposes that thematic and functional exchanges should be developed side by side with spontaneous dialogues and forums; he emphasizes the importance of *telematique* editor and moderator roles. Dervin (1989) in discussing the problem of improving access to communication systems, foresees intermediaries fulfilling the role of making the systems appealing and useful for different kinds of people. However, these approaches to the problem of trivial online dialogue, pose some implementation difficulties. It is the impression of the present author that performing online facilitation functions require enormous amounts of time from the moderator(s).

CONCLUSIONS

Limitations of the Study

First, although the experiences of the graduate students in this sample are illuminating, a small sample of self-selected graduate students cannot be claimed to be representative of graduate students at OISE. Second, the results raise a question "Can the students in this sample be considered *lead* users?"

The word *lead user* conjures an image of a highly sophisticated user taking maximum advantage of CMC systems capabilities. Some OISE graduate students do, for example, make online bibliographical searches, consult databases, reach peers in other universities through BITNET¹ and are registered in LISTSERV.² The graduate students in this sample mainly exchange messages. However, they have been online for more than one year and have incorporated the use of e-mail and Parti into their daily routines. Further, they do have ready access to CMC resources, technical help and online peers using the systems; according to the usage of the concept in this study, lead users are users that "are familiar with conditions which lie in the future for most others" (Van Hippel, 1989; p. 387).

Suggestions for Further Research

In this study the author worked out the emergent issues related mainly to Dervin's "the actors' defined purposes" category. However, a next promising step would be to address "the actors' situation" and "gaps in sense making" categories (with in-depth interviews and focus groups). In this manner, it would be possible to reach a better understanding of electronic sociability in a graduate school. It would be also interesting to study the process by which a graduate student integrates in an online experience as a passive observer. Finally, it seems important to study definitions, implementations and impact of moderating functions in different online communication experiences,

Final Conclusions

The main findings in this study are as follows: a) the phenomenon of electronic sociability coexisting with a rational-instrumental usage; and b) these students's thwarted expectations regarding of online conferencing. A promising research avenue for designers wishing to respond to users' needs for nontrivial, substantial on-line dialogue is to explore intermediary roles (e.g., moderators, electronic editors, access intermediaries) that make a system appealing and useful for a variety of people and purposes. The intermediary role in communication systems seems to be an important design issue when the goal is to change the patterns of use and exposure.

¹ A computerized network linking universities and research centres worldwide.

mailing-list server designed to make group communication easier. People with a common interest are grouped in a list which is stored on LISTSERV, then they can communicate with each other by sending mail to a special network address.

REFERENCES

- Ancelin, C. (1987). Services videotext gran public, la naissance d'un secteur economique. In M. Marchand (Ed.), *Les paradis informationnels: Du Minitel aux services de communication du futur*. Paris: Masson.
- Bell Canada (1989). Product management recommended responses to ALEX services providers inquiries.
- Borgman, A. (n.d.). *Artificial realities: Centering one's life in an advanced technological setting* (manuscript).
- Bowers, C. A. (1988). *The cultural dimensions of educational computing: Understanding the non-neutrality of technology*. New York, NY Teachers College Press.
- Charon, J. M. (1987). Teletel, de l'interactivite homme/machine a la communication mediatisee. In M. Marchand (Ed.), *Les paradis informationnels: Du Minitel aux services de communication du futur*. Paris: Masson.
- Davie, L. (1988). *Facilitation techniques for the tutor in computer-mediated-communication courses*. Paper presented at Computer Mediated Communication in Distance Education: An Open University International Conference, Milton Keynes, U.K.
- Dervin, B. (1980). Communication gaps and inequities: Moving toward a reconceptualization. In B. Dervin & J. Voight (Eds.), *Progress in communication sciences* Vol.11. Norwood, NJ: Ablex.
- Dervin, B. (1989). Users as research inventions: How research categories perpetuate inequalities. *Journal of Communication*, 39(3), 216-232
- Feenberg, A. (1987). Computer conferencing and the Humanities *Instructional Science* 16, 169-186
- Feenberg, A. (1989). The written world. In R. Mason and A. Kaye (Eds.), *Mindweave*. Oxford: Pergamon Press.
- Geertz, C. (1973). *The interpretation of cultures*. New York, NY: Basic Books.
- Grint, K. (1989). Accounting for failure: Participation and non-participation in CMC. In R. Mason and A. Kaye (Eds.), *Mindweave*. Oxford: Pergamon Press.
- Hiltz, R. (1984). *Online communities: A case study of the office of the future*. Norwood: Ablex Publishing
- Kaye, T., Mason, R., & Harasim, L. (1989). *The case for computer-mediated communication*. A Report for the Infotech Committee, British Columbia.
- Lincoln, Y.S., & Guba, E. G. (1985). *Naturalistic inquiry* Beverly Hills, CA: Sage Publication.
- Mason, R. (1989) An evaluation of CoSy on an Open University course. In R. Mason & A. Kaye (Eds.), *Mindweave*. Oxford: Pergamon Press.
- Naidu S. (1988). Developing instructional materials for distance education: A "concerns-based" approach. *Canadian Journal of Educational Communication* 17(3), 167-179.
- Teles L. (1987). *The adoption of word processing by Ph.D. students for dissertation writing: The case of a graduate school of education*. Unpublished doctoral thesis, University of Toronto.

- Tinnell, C. S. (1985) An ethnographic look at personal computers in the family setting. In M. B. Sussman (Ed.), ***Personal computers and the family***. New York, NY: The Havorth Press.
- Von Hippel, E. (1988). Lead users: A source of novel product concepts. In K. Grognaug & G. Kaufmann (Eds.), ***Innovation: A cross-disciplinary perspective***. London: Norwegian University Press.
- Zuboff, S. (1988). ***In the age of the smart machine***. New York: Basic Books.
-

AUTHOR

Alejandra Rojo is a Ph.D. candidate at the Ontario Institute for Studies in Education.

ACKNOWLEDGEMENT

I would like to thank Ron Ragsdale for his encouragement and comments in an earlier version of this paper. I also would like to thank Dr. Schwier and two anonymous reviewers for their valuable suggestions.