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The Network-Based Writing Classroom:

The ENFI Idea

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Abstract: This chapter demonstrates how a particular application of CMC, Electronic Networks For Interaction (ENFI) is being used to change the social dynamic of the writing classroom. ENFI is not software but a concept; the concept is essentially that writing is taught in a computer lab with a network supporting real-time CMC. Because it allows teachers and students to explore, collaborate, and expand on ideas in class in writing, and allows them to see each other in the process of developing ideas, writing for each other and not just to "the teacher," ENFI supplements and expands on the activities teachers can use to help students meaningfully participate in a discourse community and improve their writing.

The use of CMC to teach writing holds great promise for a number of reasons. As is apparent from other chapters in this book, CMC means people communicating with other people. Most commonly, the form such communication takes is text. Writing. People sit at computer terminals and write to each other. As the number of students sitting at terminals writing to each other increased over the last ten years, many English teachers, who had heard far too many students say they hate to write, were intrigued. Students were being pulled away from their stereo systems, TVs and late-night parties to pound away on keyboards, spending long hours sending and receiving messages over various local and national networks.

Still, we know that a lifetime of casual chatter, either talk, or "talk" in print, does not a speaker or a writer make. Therefore, we might suspect that all this chatter in writing on computer networks would not lead automatically to brilliant 500-word essays. Writing is really thinking: thinking through ideas and making them understandable to others through text. What students write on the networks in their free time are, of course, ideas, but in most cases the ideas are neither clearly expressed nor at the level of complexity we expect of college students in their academic writing. Further, learning the discourse of the nets is a skill, but not the same skill as developing a proposal in a business setting, writing a cover letter for a job or analyzing an historical event.

But, shouldn't there be a way to take advantage of the growing interest in writing on computer nets among students? Isn't there some way we can expand upon this interest to teach writing in college?

A. Applications of CMC to teaching writing:

First, let's think about the kinds of problems writing teachers face in the traditional setting that most of us are familiar with; that is, the classroom in which the teacher succumbs to the environmental imperative and automatically assumes the role of the expert.

1. Demonstrating writing.

Teachers are supposed to be the experts in the classroom, but often find it difficult to show students how they themselves write. Writing is simply too slow using traditional display mechanisms such as the chalk board or overhead projectors. Students are impatient at best, especially in a course they are most likely taking only because it's required, so will not pay attention for long while the teacher writes on the chalk board. These demonstrations would at best work only at the sentence level, in any case. Except for writing on the overhead or chalkboard, then, the only writing students see from their teacher is finished "perfect" writing in the form of handouts. The gap between their own writing and the perfect writing of their teacher, who is presumably their model for writing, may seem impossibly large.

2. Creating realistic writing tasks.

Students are typically asked to write as if they are experts, either about reading for class, about events, or about life situations. Yet, at their young age, most students are not experts. They may sense how great the gap is between the writing of experts and their own writing. Their attempts to sound authoritative, when they know almost nothing of the subject, usually result in the stilted English class essays which, unfortunately, all of us are familiar with.

3. Establishing a meaningful audience and context for students' writing.

Students tend to assume that their audience is the teacher, who usually knows far more about the subject than they do. This writing context is painfully artificial because the students feel they have very little they can actually say to the teacher that the teacher doesn't already know.

4. Encouraging writing practice.

Teachers who have thirty to fifty students would be suicidal to require papers for every class session, since students expect teachers to read and grade their papers. Yet, students should write as often as possible. Writing teachers want students to become adept at academic discourse, a complex and specialized form of discourse requiring extensive practice, yet the sheer numbers of students today overwhelm teachers and reduce the amount of teacher-monitored writing to a low level.

5. Creating collaborative opportunities.

Many think of writing as a solitary activity, but some of the most productive writing comes out of group work. If we are to train students to write as writing is often done in the real world, we should train them to collaborate, at least in the idea-gathering and organizing stages of writing. Yet, in traditional classrooms, sharing of drafts or outlines or notes is awkward. Collaborative groups will typically work only in speech,

which is a good way to develop ideas collaboratively, but does not help to transfer those ideas to paper. And we must remember that developing speaking skills is not the primary goal of the course.

6. The time lag between class discussion and student writing.

This lag is at least several hours, but most typically a day or two. Students will attend class on Monday, for example, and will be given a homework assignment. The next class is Wednesday, so the students, if they are typical, will carry out the assignment Tuesday night. This may be 36 hours after class discussion. By then, they may have forgotten the key ideas from the discussion or have lost interest.

7. Class participation.

Every teacher is familiar with the students who sit in the back like ghosts, rarely ever giving others in the class the benefit of their opinions and insights. Only the teacher knows, from what these students write in their essays, what others might have gained from their participation. These reticent students may be worried by their race, gender, or other physical characteristics such as speech impediments, but frequently they do not participate simply because they do not "think on their feet" as quickly as some of the other students.

There are other problems -- too many others -- but let's look at these seven. If teachers of skills other than writing, such as dance or art or music, were told that they could not demonstrate their skill to their students, that their students would practice -- on average -- 40 minutes a week or so, and that this practice would occur out of their sight, these teachers would be excused for refusing to attempt to teach in such an impossible situation. But, because text-generation is not like music or painting or dance -- because it is hard to read at a distance of more than a couple of feet and slow to develop --writing teachers have had to adapt to exactly these impossible conditions. Perhaps this is why many of them hide behind the red marks they make on their student's papers. If they can't actually teach them the skills necessary to be a good writer, they'll just point out little errors. The impossibility of the task may also explain why so many frustrated writing teachers in college get out of teaching writing and into content courses as soon as they can.

But we started this chapter with the hint of some relief for the writing teacher provided by CMC. Can CMC address the problems we listed above? And, if so, how?

The ENFI idea: a CMC solution to writing class dilemmas

One attempt to provide relief is the ENFI approach. ENFI means Electronic Networks for Interaction. The last word, INTERACTION, is the key to what ENFI actually does. Students meet in a writing classroom in which a local-area computer network has been set up, or the teacher brings her writing class to a networked lab. The server in the classroom or lab runs software that supports group real-time communication -- the INTERACTION in ENFI. Teacher and students sit at stations on the network and write to each other -- a group discussion in writing. Instead of the sound of voices in the room, you hear only keys clicking. Oh, some people make side comments and others occasionally laugh when a funny comment appears on the screen, but the locus of communication is really the screens, and everyone focuses on *writing*.

The teacher is fully a part of this communication in writing. Every comment that each person writes can be seen on all screens. At each station the screen shows scrolling comments from all participants; to create a

comment of your own, you use a scratch-pad window, type your comment, then send that comment to join the flow of comments coming from the group. Since everyone can write at once, a great deal of text is generated and the computer program has to create a queue, based on the order in which the server receives the comments. The resulting stream of comments is not like a natural discussion, of course, but may develop into three or four strands of separate topics. Although at first it may seem difficult to follow the separate strands or topics, classes typically get used to the nonlinear "flow" of the conversation rather quickly. Normally, the teacher does not control this "discussion," nor is she the filter through which all comments are made.

Addressing our seven problems

Below are some suggestions about how this type of live, real-time group discussion in the writing class can help to ameliorate some of the problems of traditional writing classes. In all cases, we don't claim that ENFI itself provides benefits, or that the software and the environment it creates are value-free -- indeed, as Nancy Kaplan notes, software and pedagogical innovations such as ENFI are but tools, and "no tool can be innocent, free of ideological constructions"(27). However, we do believe that a capable teacher may be able to address the problems below more effectively in the ENFI environment than if he or she works exclusively in a traditional classroom.

1. Demonstrating Writing

(Modeling text production and revision in a traditional classroom is difficult because the text is often hard to read and takes too long to generate by hand. Further, the lack of rhetorical context may make the demonstrated writing seem remote from the students' own needs and interests).

In an ENFI classroom, the teacher is fully a part of an ENFI discussion on the network (not as a traditional, controlling teacher but as a more equal participant), so the students can see the teacher producing writing-in-action; live writing; writing hot off the press, in the context of the discussion, and right on their screens. It may be encouraging for students to see their writing teacher engaged in the written discussion, writing not as the expert author of the perfectly-written class handouts, but as one more participant in a written discussion. Further, the ENFI network environment is ideal for demonstrating revision. According to Michael Spitzer, "the use of a network to show revision as it occurs may prove to be the most effective method of explaining and demonstrating the process" (63).

Leading a discussion in an ENFI setting is no picnic, of course, and most teachers accustomed to a traditional classroom are "at sea" initially. They may feel that they have lost control of the class, and many never do get their "sea legs." However, through a combination of oral discussion and writing on the network, a teacher can provide good examples of his or her writing, or any student's writing, for all students to see. Using an overhead projector with liquid crystal computer output display, classes find it far easier to discuss writing that has just occurred in class than the old method of racing out to the copy room and making 38 copies of a paper to distribute, breathlessly, to the class.

Orchestrating demonstrations of writing is not a cinch: training teachers to work in an ENFI environment is an ongoing task in our profession. Yet, once they get the idea, teachers begin to think of new ways to use an ENFI environment. Text production is no longer such a private struggle; it can now be shared more easily in a setting reminiscent of the old language labs.

2. Creating Realistic Writing Tasks

(The main audience for student writers is usually their teacher, and since the teacher usually knows far more than the student about most topics, the writing context is too artificial to generate texts which show genuine concern for audience expectations).

For students, the appeal of getting on the internet or campus network in their free time is the opportunity to meet and talk with other students, either on campus or at other campuses. This writing is fun because it's real communication with a purpose. Sometimes, writing in or for a writing class seems more like filling in a form than communication. The teacher says to write an essay, which means that the first sentence has to introduce the topic and state a theme, the second paragraph has to provide supporting evidence and so on. Students know that they will be judged on how well they fill in this form. However, the difference between fun on the nets and tedium in the essay form doesn't have to be so marked.

The ENFI environment helps the class link the fun and sense of purpose in communicating to real people in real time on the network to the process of drafting classroom assignments. Students can brainstorm early stages of a writing assignment on the network, knowing that they are communicating these ideas to others for direct feedback. Since this "class discussion" is in writing and since more students will have participated (because parallel production is possible), it will be easier for students to make the transfer to an individually-produced rough draft from an ENFI discussion than from a teacher-led oral discussion. Students in a traditional writing class will have to rely on notes from class when they face the blank sheet of paper (or the blank screen) in their dorm rooms; those enrolled in an ENFI section will have access to a printout of the discussion, which will contain not only their preliminary ideas, but feedback from other students. Further, since they will likely have contributed more to the discussion than if they had been in an oral discussion (where most students usually say very little), it is also more likely they will remember threads of the discussion.

Writing in an ENFI setting is more social and more directed than the isolated act we often associate with text production. More of the writing is actually communication for a purpose to a real and present audience (Spitzer, 65). Students do not have to rely on the teacher as the only audience for all writing. The ENFI setting better allows teachers to help students understand that writing actually has a purpose in life.

3. Establishing an audience for students' writing

(Though we've all done it, writing only to the teacher seems odd and contrived, so students may not develop sensitivity to the expectations of real and varied audiences).

One of the more complex cognitive challenges for young writers is to develop an internal sense of an audience for their writing. Walter Ong contends that "the writer's audience is always a fiction"(9); that is, that we have to use the imagination to anticipate the expectations of our audience. How to imagine what an audience needs and wants to know? And how to adjust one's style, register, and tone appropriately? In other words, how to shift from what composition specialists call "writer-based prose" to "reader-based prose"? In a traditional writing class, if the default audience for all writing is the teacher, students may not progress much toward developing reader-based prose because they practice with only one audience. On the other hand, since ENFI provides an audience for student writing other than the teacher (the other students), and since that audience responds in real-time or near real-time, we believe ENFI helps students develop audience sensitivity (Spitzer, 59; Hawisher, 86).

4. Encouraging writing practice

(Students in a traditional classroom spend most of their time listening to the teacher or working in small groups where they mostly talk; they don't spend much time writing in writing class).

In some ENFI classes, teacher and students may spend a full class period having a written discussion, both to develop ideas and to provide an opportunity for more practice in writing. The class might start with a question or comment (often provided by the instructor) and explore or expand upon the issues it raises. The ongoing discussion generates writing instead of evanescent talk, but not the formalized (often stilted) writing found in student essays. On the classroom network, students often write in a discourse style closer to speech than to traditional academic writing, and sometimes this "conversational style" is carried over into individual assignments (Batson, 32; Bump 1990a, 56). This carryover effect shows that ENFI can provide a bridge between the speaking skills of students and their writing.

We do not claim that "conversational writing" is any better than traditional academic writing -- each style develops from a distinct rhetorical context-- but because it practically forces writers to include themselves and other discussants as subjects in their sentences, conversational writing may help them avoid some of the "institutional passive" fuzziness found in much of the stilted "academese" students often think of as good writing. That the direct, active style often finds its way into more formal written assignments demonstrates that ENFI can bridge the gap between classroom and individual writing.

Because it happens in writing, ENFI allows the conversational style to cross over into formal writing assignments when students choose to begin a paper by revising their comments from the transcript of class discussion. Teachers may encourage them to polish the style and elaborate on the content, but not necessarily to edit out the direct, active voice. Thus the revised draft may more honestly reflect its grounding in the multivocal controversia of class discussion.

There is no automatic carryover from network writing to the complex writing tasks in academia, but for many students the practice in writing can help reduce writing anxiety, make writing class more enjoyable, make the teacher seem more approachable, provide more knowledge about a subject for students, and provide models of other ways to say things in writing.

5. Creating collaborative opportunities

(Collaborating in a traditional classroom is awkward because sharing text on paper is slow and tedious).

One of the most daunting experiences young students have is facing a blank sheet of paper or a blank computer screen, alone, with the task of writing an essay. While collaborative writing has its own problems, it at least is a helpful alternative to solitary writing. When students work together in small groups on an assignment, they can share ideas. It is as if they are not complete writers in and of themselves but together can be. Some are good at generating ideas or finding sources, others at organizing the ideas, and still others at drafting or editing. Though the teacher is the expert, she or he can't work with all the students individually on projects and doesn't need to. Students can and do learn from each other as well.

Further, many instructors who use ENFI have noticed a synergistic process occurring when students collaborate to generate ideas in real time written discussion (Bump 1990a, 55). That is, after one student contributes a partially formed idea, others may base comments upon it, building a new hypothesis or train of thought not possible without the interaction.

The exploratory nature of ENFI makes it ideal for invention, for testing new ideas, and for capturing thoughts

as they come into being -- before the critical consciousness has a chance to kick in and censor the statement that might, with further consideration, have seemed too odd to utter. Because of the sheer pressure to enter into the conversation or not be heard, students must think on the fly, inventing at the edge of consciousness and possibility. In so doing they may stumble upon truths and ideas they might have cast off in the highly reflective self- consciousness of the "solitary writer crafting sentences" scenario. If they permit these utterances to fly out, others may see in them ideas they had not foreseen, and build upon them. In so doing, students actually **collaborate** to bring thought-structures into being through writing.

The ENFI environment provides new avenues and support for collaboration because text generation is so easy and sharing text less a problem than in a traditional classroom. Collaboration is the default mode in an ENFI setting.

6. The time lag between class discussion and student writing

(So much time elapses between class discussion and the actual writing of homework assignments that interest in and understanding of the ideas under consideration may have faded).

Before computer labs, writing teachers had to mostly talk about writing while students listened. Occasionally students would join in, but in general, they would write later. This is still the prevalent model in writing classes. For capable writers, talking about writing can be helpful because it helps conceptualize the task of writing in different contexts, but for the average student it is probably better to engage in more practice and less discussion.

Working in an ENFI environment, it is possible to complete parts of the writing process during class time, eliminating the time lag between invention and text production. With prompts from the teacher and comments from their peers, students capture and develop ideas in writing from the outset of the ENFI session. Class discussion, writing practice, and teacher feedback are not spread out over a week or more, but can be telescoped into one class session.

7. Limited and unequal participation

(Few students speak up in class discussion; considerations such as gender, race, and physical characteristics prevent some from participating equally or at all.)

Instructors who use ENFI have noted that several of its features tend to draw students into the conversation. The fact that they have an audience other than the teacher empowers them to voice their own opinions with some conviction instead of sitting back and letting the teacher's wisdom wash over them. Students gain confidence in their ideas, and, because they come to depend on each other for feedback, can develop a strong sense of community in a limited time frame. Some teachers have even noted that students involved in ENFI participate more because they feel the same companionship and warmth that we associate with friendship from some of their peers (Hawisher, 87). The sense of investment in and belonging to a community of writers engaged in a common goal pervades and facilitates the interactions; that engagement is reflected not only in increased participation, but also in the level of personal involvement students put into their written comments through the use of personal pronouns and active verbs (Murray, 217).

Some of the preliminary research indicates that because ENFI eliminates many of the physical cues of face-to-face communication, it allows more and different types of students to participate (Kiesler, Siegel, and McGuire, 1125; Faigley, 8; Bump 1990a, 50-51, 55). The more reticent students have time to compose

responses, and the comments in general tend to be more frank but better thought out. Students tend to be less afraid about "speaking up" in class. On the computer, students have little recourse to body language, or feelings of inferiority based on race, gender, and other hierarchies, especially when the participants are anonymous (Cooper and Selfe, 853; Hawisher, 88). But anonymity is a double edged sword that can encourage "flaming" (rude comments), as we shall see later.

Unlike face to face discussion, in ENFI exchanges, everyone has access to the "floor" at the same time. Students can be working on comments at the same time, and post them to the group almost simultaneously. Thus no one is left out because he or she cannot get a word in edgewise.

ENFI and the teacher

We've listed a number of typical writing-class problems that ENFI can help address. However, there is no magic in a communication program, only in the teachers who use it. We are describing potential advantages; none of these accrues automatically. As always, the teacher is the critical factor. However, in our experience of observing ENFI over its lifetime (since 1984), it is clear that only a limited number of teachers who try to work in an ENFI environment succeed, or even feel comfortable. Whether this will change as more teachers themselves become involved with computers is pure speculation. Right now, ENFI is a presence on over a hundred campuses in the U. S., but in no instance is ENFI the predominant writing class environment used on campus.

B. Psychological and Social Effects of ENFI

Those of us working in an ENFI environment have noticed an interesting psychological aspect: visitors to this kind of class don't disrupt a group discussion as they do in a traditional classroom. We would expect, in a traditional classroom, that if a visitor entered the room during a class discussion or lecture all eyes would move to the visitor. If the students were working in small groups, a visitor would cause less disruption. However, regardless of whether an ENFI class is broken into small groups or is involved in a whole class discussion on the network, a visitor to the room doesn't cause disruption. In other words, psychologically, an ENFI environment is always a multiply-centered environment. This is a by-product of the slight delay between a person's "utterance" and other people perceiving that utterance (by reading it on the screen). The "real-time" here is not quite real-time; it is delayed real-time.

There is no "floor" for people to compete for, or we might say that if there is a floor, everyone can share it. People are all engaging in a conversation of sorts but each is working on different parts of the conversational stream, and each is working at a different pace. They share the same place physically but are in different time dimensions. The sense of private space is thus strengthened and enlarged.

ENFI, then, is not quite real-time conversation, but is not quite electronic mail, either. Everyone actually breathes the same air, and, from time to time, they may all react to the same stimulus, either on screen or off. And, of course, people do talk to each other even while they write to each other on the network. Existing in this never-never land of psychologically overlapping but separate time frames, physical closeness and chronological distance, ENFI is a strange beast, indeed. We have had the experience of standing up in class and trying to start an oral discussion but having to wait while students finished responding to us in writing! We seemed to be carrying on two conversations at the same time, even seeming to exist in two different places at once! After a semester of this, one's concept of writing (or even of reality) may never be the same. The multiple centers of invention and discourse help to destabilize monological, teacher-based sources of authority, and encourage students to take an active role in the written production of knowledge from a variety

of perspectives (Kiesler, Siegel, and McGuire 1984; Hawisher and Selfe 1991; Hawisher 1992). Students can become author-ities in localized centers of discourse.

Adopting a network persona

Within this unique psychological space, participants find themselves adopting voices and personae they may not recognize. This "increased role fluidity" seems to come with the territory. In the ENFI writing environment, one seems to be anonymous -- or at least the "agent" writing on the screen, prompted by your fingers, is. This sense of anonymity (even when names are attached to all messages) leads to experimentation with one's usual voice. Students may "flame" (use rude, inflammatory language) against each other unless strictly controlled by the teachers; or, more positively, they may experiment with different personae in their writing. A shy student may become more aggressive. Professor Jerome Bump at the University of Texas found one of his certified introvert students behaving like an extrovert (Bump divided his sections of a course on the basis of the Meyers-Briggs scale) (Bump, 1990b). When he reported this at a conference, others in the audience recognized the conversion experience (from shy to outgoing -- at least on the net) students can have in an ENFI environment.

Exploiting the network-persona syndrome

Teachers can take advantage of the tendency to play-act on the ENFI network by creating situational simulations. Instead of doing the usual "let's discuss the problems of urban America," a writing teacher can instead create an improvisational drama based on readings students do before class about a particular problem, say, crime. They might be asked to act as members of a jury during the trial of a young first-time offender. On the network, they can act out their jury roles and explore the issue from the inside. They can move, imaginatively, into a drama about the problem; they are no longer in a classroom but in the jury room. The drama works not only because of the network's psychological prompting to explore new personae, but because the interaction, being in writing, is slow enough for students to think of an appropriate line, and masked enough to avoid the embarrassment of being "on stage."

Thus, CMC's ability to alter the social dimensions of a group can be turned to advantage. The very "playing around" and "flaming" phenomena noticed by many CMC-using teachers may well be the key advantages of CMC. Writing is, after all, an exercise in creating a persona or ethos that will inspire a desired reaction from a particular audience. The ENFI environment gives students a real audience and context for that persona.

The challenge to the teacher

Often, we believe, instructors new to ENFI struggle to make this environment work in the same way as their traditional class. They have faith that what they do in their traditional class somehow leads the students toward learning or improvement, so, regardless of whether they have evidence or not, the practices they've used in their traditional classrooms (like oral discussion and grading papers) seem sacrosanct . But, holding on to the traditional makes it hard to see the opportunities in an ENFI environment, or in other CMC environments. The fluidity of roles or personae in ENFI, along with the simulations that fluidity enables, is one of the great strengths of ENFI. Yet, when students adopt an alternate persona on the network, teachers may react negatively, thinking of it as frivolity. At best, they may tolerate it while trying to move ahead with a "serious" (teacher-led) discussion, as if a traditional discussion were necessarily the most appropriate or even productive activity in this environment.

Given that such a different psychological environment is created within the ENFI setting, and that different

practices are therefore appropriate for reaching the goals of a course, how will teachers make this shift? As this discussion of ENFI may suggest, re-conceiving of one's role in an ENFI classroom is not something one can achieve overnight, or even after an introductory workshop.

We believe that if there are enough training opportunities, writing teachers at least have a fighting chance to make the adjustment. However, even with sufficient training, teachers are still surrounded by an entire profession and the whole world, both of which seem to believe writing should be taught very much as it has always been taught, albeit with some gestures toward collaborative work and the writing process. It is hard to swim upstream.

C. Summary

CMC, in the form of ENFI, offers unusual and challenging opportunities for the age-old profession of teaching others to write. Because ENFI significantly alters familiar social and psychological dimensions of the writing classroom, the positive effects we mentioned cannot always be achieved. Many teachers are therefore afraid to try ENFI, or, having tried it, retreat back to the traditional classroom. Yet, even as an undertaking limited in national scope, ENFI provides a new perspective on how people learn to write. Those who try it may never see their job the same way again. Here, as elsewhere in our society, CMC continues to nibble away at our traditional way of doing things.

Software That Creates an ENFI Environment

ENFI is an idea, not software. It is an environment or what we might call an alternative classroom, and can be created by a number of different software solutions. Among those ENFI software solutions available now:

1. Aspects (Macintosh)

Group editing software which allows up to 12 users to share and edit files on a local network, or even across a wide-area network. Within the writing classroom, such a program might be useful for small-group editing exercises and peer-critiques. A convenient "chat box" window allows participants to have real-time written conversations as they edit. Thus, Aspects is ENFI software with the powerful bonus of supporting group editing.

Available from Group Technologies, 1408 North Fillmore Street, Suite 10, Arlington, Virginia 22201; (800) 476-8781.

2. ClassWriter (Macintosh)

Includes:

A. The Electronic Dialectical Notebook, a server based conferencing program which allows the instructor to send a text along with an exercise to all the students' machines. The students are then electronically connected in pairs, where they complete the exercises and comment on each other's responses.

B. Conversation, a server-based ENFI tool which uses a local area network for conferencing. In Conversation, each message has its own window, accessible by double clicking on a menu which constantly updates as the conversation progresses. Conversation allows communication among diads or the entire group.

Available from Intellimation, Dept. 2HF, 130 Cremona Drive, P.O. Box 1530, Santa Barbara, California 93116; (800) 346-8355.

3. Conference Writer (Macintosh)

Using its own word processing program and editor, Conference Writer allows writers to compose and share their writing with others in up to 12 groups.

Available from RDA/Mind Builders,. 10 Boulevard Avenue, Greenlawn, NY 11740; (800) 654-8715.

4. Daedalus Integrated Writing Environment

A bundle of five server-based writing tools, which contains:

A. Write, a basic word processor.

B. Invent, seven sets of heuristic prompt questions, based on, among others, Aristotelian, Burkean, and tagmemic (Young, Becker, and Pike) rhetorical theories, to aid in the invention process.

C. Respond, a revision heuristic for responding to peers' drafts.

D. Contact, an electronic mail program for the composition classroom.

E. Interchange, a real time conversation program which, like Conversation, uses simple networking capabilities to make text-based classroom discussion possible. Unlike Conversation, Interchange adds messages to a constantly scrolling field, which updates as soon as the participant clicks on the "send" button.

Available for Macintosh or DOS from The Daedalus Group, 1106 Clayton Lane, Suite 248W, Austin, Texas 78723; (800) 879-2144.

4. Forum (Macintosh)

Similar to interchange, Forum sets up a discussion file or group of files on the server, which participants may join and contribute to. A convenient feature is the Forum Administration program, which can create and read detailed statistics of user activity.

Contact Robert Boston, 521 12th Street, Ames, Iowa 50010. Internet: boston@iastate.edu. Bitnet: S2.RSB@ISUMVS.

5. OpenForum (Macintosh)

A hypercard based brainstorming tool which uses Appletalk to share idea windows. Each post is appended to the session record, which all other connected participants can view and respond to.

Available from MasterPlan, Inc., 6314 High Street, Haslett, MI 48840; 517-339-2478.

6. Real-time Writer

The original ENFI environment. Runs on a local-area network and is near real-time; "conversation" scrolls on

screen as new messages are received; database searching ability.

Available from Real Time Learning Systems, 2700 Connecticut Avenue, N.W., Washington, DC 20008-5330; (800) 832-2472.

7. TeamFocus

The most complex but the richest environment. This set of tools was developed for group decision-support but is also used as a sequence of environments to support groups going through a writing process. On local-area networks.

Available from the IBM TeamFocus Support Center, Endicott, NY. Also, contact Trent Batson, Gallaudet University, Washington, DC.

Reference List:

Batson, Trent.
"The ENFI Project: A Networked Classroom Approach to Writing Instruction." *Academic Computing*, 2 (5) (1988), 32+.

Bump, Jerome.
"Radical Changes in Class Discussion Using Networked Computers." *Computers and the Humanities* 49: (1990), 49-65 (1990a).

_____.
Presentation at the Computers and Writing Conference, Austin, Texas, May 1990 (1990b).

Cooper, Marilyn, and Cynthia L. Selfe.
"Computer Conferences and Learning: Authority, Resistance, and Internally Persuasive Discourse." *College English* 52 (December 1990): 847-69.

Faigley, Lester.
"Subverting the Electronic Network: Teaching Writing Using Networked Computers." *The Writing Teacher as Researcher: Essays in the Theory and Practice of Class-based Research* . Eds. Donald A. Daiker and Max Morenberg. Portsmouth: Boynton/Cook, 1990. (290-311)

Hawisher, Gail E.
"Electronic Meetings of the Minds: Research, Electronic Conferences, and Composition Studies." *Re-Imagining Computers and Composition: Teaching and Research in the Virtual Age* . Gail E. Hawisher and Paul LeBlanc, eds. Portsmouth: Boynton/Cook, 1992. 81-101.

Hawisher, Gail E. and Cynthia L. Selfe.
"The Rhetoric of Technology and the Electronic Writing Class." *College Composition and Communication* 42 (1991): 55-65.

Kaplan, Nancy.
"Ideology, Technology, and the Future of Writing Instruction." *Evolving Perspectives on Computers and Composition Studies: Questions for the 1990s*. Eds. Gail E. Hawisher and Cynthia L. Selfe.

Urbana, IL, and Houghton, MI: NCTE and Computers and Composition Press, 1991.

Kiesler, Sara, Jane Siegel, and Timothy W. McGuire.
"Social Psychological Aspects of Computer-Mediated Communication." *American Psychologist* 39 (1984): 1123-1134.

Murray, Denise.
"The Composing Process for Computer Conversation." *Written Communication* 8 (January 1991): 35-55.

Ong, Walter.
"The Writer's Audience is Always a Fiction." *Publications of the Modern Language Association*, 90 (1975): 9-22.

Spitzer, Michael.
"Computer Conferencing: An Emerging Technology." *Critical Perspectives on Computers and Composition Instruction*. Eds. Gail E. Hawisher and Cynthia L. Selfe. New York: Teachers College Press, 1989.

General Readings:

Amdahl, Mark.
"Aspects 1.0." (Review) *Computers and Composition* Vol 10, no. 1 (November 1992) 89-92.

A review of Aspects, one program that allows an ENFI environment to be created through shared text files on networked machines.

(The entire November 1992 issue of *Computers and Composition* is recommended to writing teachers seeking information about software for composition.)

Barker, Thomas T. and Fred O. Kemp.
"Network Theory: A Postmodern Pedagogy for the Writing Classroom." *Computers and Community.* Ed. Carolyn Handa. Portsmouth: Boynton/Cook, 1990. 1-27.

Barker and Kemp compare the traditional "proscenium" (teacher-centered) classroom with a new, postmodern approach to writing instruction based on what they call "network theory." They provide a model for classroom pedagogy which encourages shared knowledge, collaboration, and student enfranchisement.

Batson, Trent.
"The ENFI Project: A Networked Classroom Approach to Writing Instruction." *Academic Computing*, 2 (5) (1988), 32+.

Batson details the rationale and findings of the ENFI Project, a three year study of classes at five universities in which students using ENFI software were compared with those in traditional classrooms.

Batson, Trent, and Joy Kreeft Peyton.
"ENFI Project Report 1985-1986." November 1986. Unpublished manuscript available from the ENFI

Project, Gallaudet University, 800 Florida Ave. NE, Washington, DC 20002.

A more detailed version of the above study. A comprehensive bibliography is also available upon request.

Brown, Lady Falls.
"The Daedalus Integrated Writing Environment" (Review) *Computers and Composition* Vol 10, no. 1 (November 1992) 77-88.

A review of the latest incarnation of Daedalus' five program writing software bundle, formerly known as DIScourse. One of the programs, Interchange, has been widely used to create ENFI environments in writing classrooms.

Bruce, Bertram; Joy Kreeft Peyton, and Trent Batson.
Network- Based Classrooms: Promises and Realities, Cambridge University Press, 1993.

Bump, Jerome.
"Radical Changes in Class Discussion Using Networked Computers." *Computers and the Humanities* 49: (1990), 49-65.

Bump describes the ways in which ENFI-based written discussions changed the dynamics of classroom participation and his students' attitudes toward writing.

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Presentation at the Computers and Writing Conference, Austin, Texas, May 1990.

Burns, Hugh.
"Teaching Composition in Tomorrow's Multimedia, Multinetworked Classrooms." Hawisher and LeBlanc 115-130.

Burns discusses the strengths and weaknesses of using multimedia and multinetworking , (a kind of long-distance ENFI) to link writing classes at remote sites.

Cooper, Marilyn, and Cynthia L. Selfe.
"Computer Conferences and Learning: Authority, Resistance, and Internally Persuasive Discourse." *College English* 52 (December 1990): 847-69.

Eldred, Janet, and Ron Fortune.
"Exploring the Implications of Metaphors for Computer Networks and Hypermedia." Hawisher and LeBlanc 58-73.

In this article, Eldred and Fortune situate electronic conferencing within the metaphorical structures we use to describe communicative forms. They problematize the notion that ENFI is purely written communication by showing how teachers discussing "written conversation" are "continually thrown back into the language or metaphor of speech" (63).

Faigley, Lester.
"Subverting the Electronic Network: Teaching Writing Using Networked Computers." *The Writing Teacher as Researcher: Essays in the Theory and Practice of Class-based Research* . Eds. Donald A.

Daiker and Max Morenberg. Portsmouth: Boynton/Cook, 1990. (290-311) In a study somewhat similar to Bump's, Faigley discusses his experiences using ENFI with writing classes. Faigley's findings indicate that "reading and writing are inherently social," that in ENFI based discussion "the many voices act out Bakhtin's principle of dialogism," and that "computers joined in a network can be a means of liberation, particularly for those students who are often marginalized in American classrooms."

Hawisher, Gail E.
"Electronic Meetings of the Minds: Research, Electronic Conferences, and Composition Studies." Hawisher and LeBlanc, 81-101.

Hawisher situates electronic conferencing, both synchronous and asynchronous, within the larger frameworks of composition pedagogy and social constructionism. Her section on the advantages and disadvantages of using electronic conferences will be especially valuable to writing teachers.

Hawisher, Gail E. and Cynthia L. Selfe.
"The Rhetoric of Technology and the Electronic Writing Class." *College Composition and Communication* 42 (1991): 55-65.

Hawisher, Gail E. and Paul LeBlanc, eds.
Re-Imagining Computers and Composition: Teaching and Research in the Virtual Age . Portsmouth: Boynton/Cook, 1992.

A must-read for computer-using writing teachers. These essays re-assess the present state of computer assisted writing instruction, with a look toward the future. Most notably, they challenge our assumptions about what writing is, and what composition pedagogy should be.

Kaplan, Nancy.
"Ideology, Technology, and the Future of Writing Instruction." *Evolving Perspectives on Computers and Composition Studies: Questions for the 1990s*. Eds. Gail E. Hawisher and Cynthia L. Selfe. Urbana, IL, and Houghton, MI: NCTE and Computers and Composition Press, 1991.

Kaplan argues that software and pedagogies for computer-based writing instruction, like other tools and pedagogies, are based on often-unstated social conventions and assumptions about authority and power. Since there is no such thing as a value-free or neutral program or approach, we must be aware of the possibilities for exclusion or disenfranchisement inherent in any approach.

Kemp, Fred O.
"Who Programmed This? Examining the Instructional Attitudes of Writing-Support Software." *Computers and Composition* Vol 10, no. 1 (November 1992) 9-24.

This article contains a section which examines computer-mediated communication's role in changing assumptions about writing and composition pedagogy. Kemp argues that the students' use of CMC in the writing classroom is "less a passive reception of knowledge and more an active generation of skills (19), and that "such networked pedagogy challenges the notion that writing is either strictly formal or strictly personal (19).

Klem, Elizabeth, and Charles Moran.

"Computers and Instructional Strategies in the Teaching of Writing." *Evolving Perspectives on Computers and Composition Studies: Questions for the 1990s*. Gail E. Hawisher and Cynthia L. Selfe, eds. Urbana, Illinois: NCTE, 1991. 132-149.

This article also contains a section on CMC in the networked writing classroom which discusses the possibilities for interactive and collaborative work and CMC's potential to shift the locus of power from teachers to students.

Langston, M. Diane, and Trent Batson.
"The Social Shifts Invited by working Collaboratively on Computer Networks: The ENFI Project." *Computers and Community*. Ed. Carolyn Handa. Portsmouth: Boynton/Cook, 1990 (140-59).

A detailed examination of some of the social shifts which often occur in ENFI classrooms, this article contains a short sample of an ENFI session transcript and shows how the adoption of ENFI can move classrooms from "presentational to environmental, "can shift the teacher from evaluator to participator, can move classroom activity from "recitation to collaboration," and can change composition from an "individual to [a] social" act.

Mason, Robin and Anthony Kaye, eds.
Mindweave: Communication, Computers and Distance Education. New York: Pergamon Press, 1989.

Although it deals primarily with electronic conferencing in distance education, this text makes an important contribution to network theory in its suggestion that electronic conferences have the potential to weave together multiple perspectives and sources of information from participants, a phenomenon they call "mindweave."

Moran, Charles.
"Computers and the Writing Classroom: A Look to the Future." Hawisher and LeBlanc, 7-23.

The section of Moran's article dealing with the on-line classroom provides a detailed description of the CMC-using electronic university of the future. While outlining some of the benefits of the on-line classroom, Moran is careful to mention the major drawback of CMC: that it lacks the visual cues of face-to-face communication. He is optimistic, however, "that we will develop new conventions -- such as the 'emoticons' of e-mail correspondence -- once we have learned to live and work in our virtual classrooms" (19).

Neuwirth, Christine, et al.
"Why Write --Together -- Concurrently on a Computer Network?" *Networked-Based Writing Classrooms: Promises and Realities*. Eds. Bertram Bruce, Joy Kreeft Peyton, and Trent Batson. New York: Cambridge University Press, 1993.

Schriner, Delores K. and William C. Rice.
" Computer Conferencing and Collaborative Learning: A Discourse Community at Work." *College Composition and Communication* 40 (December 1989) 472-78.

Selfe, Cynthia L. and Paul R. Meyer.
"Testing Claims for On-Line Conferences." *Written Communication* 8 (April 1991): 163-98.

Spitzer, Michael.
"Computer Conferencing: An Emerging Technology." *Critical Perspectives on Computers and Composition Instruction*. Eds. Gail E. Hawisher and Cynthia L. Selfe. New York: Teachers College Press, 1989.

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"Local and Global Networking: Implications for the Future." *Computers and Writing: Theory, Research, Practice*. Deborah H. Holdstein and Cynthia L. Selfe, eds. New York: Modern Language Association of America, 1990. 58-70.

This article deals with both local and long-distance CMC, and discusses a wide range of possible effects of ENFI on writing classrooms.

Taylor, Paul.
"Social Epistemic Rhetoric and Chaotic Discourse." Hawisher and LeBlanc, 131-148.

Taylor relates synchronous conferencing (ENFI) to chaos theory in order to show how the communal text and synergistic interactions generated by such conferencing challenge our notions of originality, authorship, and coherence.

Thomson, Diane.
"Interactive Networking: Creating Bridges between Speech, Writing, and Composition." *Computers and Composition* 5.3 (1988): 17-22.

Tuman, Myron.
Word Perfect: Literacy in the Computer Age. Pittsburgh: University of Pittsburgh Press, 1992.

In his chapter entitled "The New Writing," Tuman contextualizes classroom CMC efforts such as ENFI in terms of their cultural implications. He discusses and problematizes the potential for critical thought, collaboration, and consensus in a CMC environment.