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ABSTRACT

The similarities and differences in the responses student writers received from peer groups communicating face-to-face and by electronic mail were examined in this study. Subjects were 20 English/language arts teacher education students at the University of Virginia, who were divided into four groups with each group randomized to a treatment order (face-to-face or electronic mail first) and topic order. Comparisons were made on the number, tone, and content of writers' comments; writers' reasons for revisions; quality of final compositions; and writers' preference for a mode of communication when forced to select a single mode. Analyses of data obtained from the peer response sessions, follow-up interviews, and the students' compositions indicated that: (1) writers received equal numbers of comments in the two modes of communication; (2) positive comments addressing specific, substantive features of writers' text predominated in both modes, although writers received greater numbers of these comments in face-to-face sessions; (3) few differences were found in writers' reasons for revisions, but they identified the advice of peers with equal frequency for both kinds of sessions; and (4) the final compositions were of comparable quality. It was concluded that electronic mail sessions may function best as a complement to rather than a substitute for face-to-face sessions. Implications are drawn for a prototype in which an electronic mail environment could provide the tools necessary for teacher education students to learn to write and to teach writing, and data for the study are presented in three tables. (43 references) (Author/EW)

A Look at Writers' Comments Shared on Computer Screens: Can Electronic Mail Facilitate Peer Group Response?

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a paper presented at the annual meeting of the AERA
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Abstract

As school systems integrate new technologies in their curricula, teachers' need for theoretically sound, research-tested applications of emerging technologies increases. Electronic-mail environments, increasingly available at all levels of education, can be structured to facilitate communication among student writers. The purpose of this study was to determine the similarities and differences in the response writers received from peer response groups communicating face-to-face and by electronic mail.

Twenty writers--English/language arts teacher education students--were randomly assigned to one of four groups, then randomized to treatments. The counterbalanced, repeated measures design required each group to complete two writing tasks and undergo treatment at two levels of the independent variable: face-to-face communication and electronic-mail communication. Comparisons were made on these dependent variables: the number, tone, and content of writers' comments; writers' reasons for revisions; quality of the final compositions; and writers' preference for a mode of communication, when forced to select a single mode.

Writers received equal numbers of comments in the two modes of communicating. Positive comments that addressed specific, substantive features of writers' texts predominated in both modes, although writers received greater numbers of these comments in the face-to-face sessions. While few differences were found in writers' reasons for revisions, writers identified the advice of peers with equal frequency for both kinds of sessions. The final compositions were of comparable quality.

Writers' statements of preference and patterns of responding indicate that electronic-mail sessions may function best as a complement rather than as a substitute for face-to-face sessions. Given appropriate responding procedures, topics of conversations, and on-line leadership, electronic mail can expand writers' conversations during various stages of the writing process. Twelve of the seventeen continuing students requested an ongoing electronic-mail account, an indicator of their affinity for the mode of communicating. Implications are drawn for a prototype in which an electronic-mail environment could provide the tools necessary for teacher education students as they learn to write and to teach writing.

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Introduction

In the first wave of the educational reform movement begun in the mid-1980s, state legislatures enacted legislation to increase high school graduation requirements, lengthen school days and years, and implement standardized testing to assess student competencies. As the second wave of reform has focused attention on local districts and their teachers as agents of change rather than the objects of change, improved use of technology in the schools has become an important concern (National Governors' Association, 1986). The nation's governors, policy makers increasingly interested in educational practice, have urged schools to use the newest technologies for learning and recommended that all prospective teachers should learn about "effective and emerging uses of technology in their respective curriculum areas" (National Governors' Association, 1986, p. 130).

The effective partnership of teaching and emerging technologies depends on use of the appropriate tool for a purposeful task. While the range of technological tools available to schools will likely increase in the coming years, the tool most often placed in the hands of students now is surely the

microcomputer, as contrasted to videodiscs or robotics, for example. By investigating methods by which microcomputer technology can support learning, researchers guide the use of a tool abundantly available, although currently used in a narrow range of applications.

One area in which microcomputer technology has been underutilized is secondary language arts instruction. What might constitute appropriate use of the microcomputer as a tool in language arts instruction? Recently English educators have directed their attention to alternatives to computer-assisted programs since the linear, drill and practice format of these first programs seemed incompatible with writing process instruction. Some of the alternatives focus on the computer as a tool for conversation among writers, networking students in distant locations or enabling students within a classroom to read others' drafts in progress (Sadler & Greene, 1986; Batson, 1986; Levin, 1985). Judith A. Langer, co-editor of Research in the Teaching of English, has suggested that the next generation of computer research in education must expand the notion of the computer as tool beyond a "process-facilitating text editor" to a "tool for conversation" (1986, p. 118). Langer has envisioned a community of student writers and their teachers discussing the nature of a writing task and sharing their works in process. She has asserted: "Skillfully introduced, the computer has the possibility of providing a significantly richer and more interactive environment for communication (both in face to face and computer conversation) than is presently possible within the traditional classroom" (p. 118).

Face-to-face conversations in which student writers share their drafts to provide and receive peers' comments are a staple in writing process instruction (Gere, 1987). Peer group conversations offer student writers the opportunity to learn how to talk about writing problems and later internalize that talk as a tool to solve problems and ultimately to improve their writing. Moreover, writers hear an audience's reaction to their writing. In composition classes, peer response sessions are conducted face-to-face and are generally limited to a single class session. But the increased availability of computer networks means that the technology to connect students with other students by electronic mail is here. Among the seeming advantages of this mode of communication is the convenience for the users; they do not have to be present at one time in one place to use the network as a way of responding to one another's writing. The freedom from space and time limitations allows more opportunity for response.

But the success of electronic-mail networks to generate effective response, in terms of characteristics of the comments and their use by writers, has not previously been formally assessed. Instructors who have observed students' use of an electronic-mail network for peer responding have described their impressions of students' frequency and type of communications (Kinkead, 1987; R. Smith, personal correspondence, November 18, 1986). Kinkead's interviews with writers lead her to conclude that "computer conferences actually lend themselves to responding to content" (p. 3). Smith finds students' comments sent via the

local area network "often substantive and detailed; students' use of those comments tends to be frequent and evident as one reads later drafts."

How may the success of a peer response group be judged? Gere and Abbott (1985) have suggested that the success of a writing group may be assessed in terms of the language of the group: what is the nature of the comments given and received. Research to quantify and analyze the language of face-to-face writing groups has been conducted with writing workshops in elementary schools (Crowhurst, 1979) and middle and high school writing groups (Gere & Abbott, 1985; Gere & Stevens, 1985; Freedman & Bennett, 1987; Freedman, 1987). In the tradition of their work, this study focuses on the actual response received by writers in peer response sessions--its nature and its use by writers as they revise their texts.

Whether the response will be similar or different from that given by the same writers communicating in the more standard mode--face-to-face--is the major question addressed by this research.

Aims

This study tested an emerging technology--electronic-mail communication--as a support for writers as they participate in peer response groups. The purpose of the study was to determine the similarities and differences in the response received by peer writers using two modes of communicating: face-to-face and by electronic mail.

The primary purpose of a peer response group, regardless of the means by which the writers provide and receive response--is to generate response. The success of this instructional tool--the peer response group--can be judged by the response that is generated, especially in terms of the characteristics of effective response. The characteristics of effective response are:

1. The response must exist. The quantity of response made available to student writers is a preliminary indicator of the success of the group to provide response.
2. Effective response is positive and encouraging in tone.
3. Effective response focuses on the actual content of the writing--addressing specific, substantive features of the paper.
4. From the writer's point of view, effective response is that which the writer uses to make revisions that bring the writing product closer to the desired end product (Freedman, 1984; Freedman, Greenleaf, Sperling, & Parker, 1985; Hillocks, 1986).

The study, therefore, addresses the following questions:

1. Does the amount of response among peer writers differ for the two modes of communicating?
2. Does the tone of the response (positive, negative, or neutral) differ for the two modes of communicating?
3. Does the content of the response (evaluative and generalized, substantive and text-specific, or other) differ for the two modes of communicating?

4. Do the tone/content combinations of the response (e.g. positive evaluative and generalized) differ for the two modes of communicating?
5. Do the reasons that writers give for the subsequent revisions (general audience focused, group-specific audience focused, writer focused, subject focused, text focused, or other) differ for the papers written after the two modes of communicating?
6. Will writers state a preference for receiving peer response face-to-face or by electronic mail?
7. Will papers written after the two modes of communicating differ in their suitability for submission for publication, as determined by an editorial board?

Method

Participants

The twenty writers who participated in the the peer response groups were students at the University of Virginia during the spring semester of 1987. Nineteen of the twenty were currently or had previously enrolled in courses designed to prepare teachers for elementary language arts or secondary English teaching assignments. The volunteers were asked to engage in a study that would allow them to (a) work with groups of other student writers to prepare publishable papers and (b) to learn how to use electronic mail. Eighteen of the group reported having used a computer before; three writers had equipment at home that allowed them to log on to electronic mail from their homes.

The writers received training and two week's practice in electronic-mail communications. After the training, the participants were matched on typing speed and randomly assigned to one of four groups. Each group was then randomized to a treatment order (face-to-face first or electronic-mail first) and topic order. The writers in each group completed a writing task under each of the two treatment conditions, with the order of treatment condition and order of topic (for the writing task) counterbalanced among groups.

Writing Task and Peer Response Group Format

Depending upon group assignment, each writer received one of these topics for the first writing task:

Topic #1. Should English teachers be involved in the teaching of values in the classroom. If so, how?

Topic #2. How do you provide for the effective use of small groups in the classroom?

Both topics were listed in the October 1986 English Journal "Call for Manuscripts"(p. 51). These topics offered several advantages to writers: the audience, topic, and length were specified. The topics were of concern to preservice teachers. Additionally, writers hoped to see their work in print. And writers were allowed to engage in their usual writing process. The conditions of this study gave students the opportunity to produce multiple drafts, engage in pre-writing activities, and make revisions as they chose (Charney, 1984; Freedman & Cafee, 1983; White, 1985; Sanders & Littlefield, 1979).

Each writer received a description of the requirements of the writing task, an English Journal Style Sheet, and Guidelines for Nonsexist Use of Language in NCTE Publications.

Writing groups received training in peer response groups procedures. Procedures for the face-to-face sessions and electronic-mail sessions were adapted from those used in the Teaching Composition classes at the University of Virginia Curry School of Education. They, in turn, are an adaptation of guidelines provided by Peter Elbow (1973) for the "teacherless writing group" and Ken Macrorie (1984) for the "helping circle." Groups meeting face-to-face observed the following rules:

1. The writer reads the same selection aloud twice, taking a short break between readings. Prior to the second reading members of the group receive a copy of the draft.
2. The writer does not apologize for or make explanations for the paper.
3. Listeners attempt to form a general impression of the selection during the first reading and take notes during the second reading.
4. Each listener, following an established order, offers positive comments for two minutes. The response follows this pattern:
   a. SUMMARIZE: Paraphrasing, putting the paper in the listener's words

b. POINT: commenting on parts of the paper the listener liked--pointing to specific phrases, sentences, sections that have contributed to the response

c. TELL: describing how the paper made the listener feel--describing the reaction, relating the paper to something the reader remembers, telling the author what the listener wants to know more about

5. The writer may ask others for their help with particular parts of the paper after all listeners have responded.

6. This process is repeated until all five participants in the group have read their works.

The procedures used in electronic-mail sessions were similar. Members of the groups received a copy of each writer's manuscript and were asked to read it twice before responding.

Data Collection

Audio tape recordings of the face-to-face meetings were transcribed to provide measures of the response writers received in those sessions. Similarly, messages sent by electronic mail were downloaded from the mainframe computer to disk to provide transcripts of the electronic-mail sessions. The writers also submitted copies of their manuscripts shared in the peer response sessions and the drafts revised after the sessions. Additionally, each writer was interviewed following each treatment; audiotapes of these interviews were transcribed.

Comparisons between face-to-face sessions and electronic-mail sessions were made on these dependent variables:

the number

the tone

the content of writers' comments

writers' reasons for revisions

quality of the final compositions

writers' preference for a mode of communication, when forced to select a single mode.

Focus of Analysis

The major focus of the analysis presented here is the response provided to writers in the peer response sessions. Response is defined as the feedback or reactions provided by the members of the peer response group to fellow writers. The comments that comprise the response may be evaluative in nature--informing the writer of the success of the writing--or nonjudgemental--providing the writer with a paraphrase or a description of the reader's reaction (Freedman, 1984; Lamberg, 1980).

Comments are the individual units of response analyzed in this study. Comments are discrete reactions to a specific aspect of the paper or to the paper in general (Crowhurst, 1979). Each comment is a segment of the spoken or written discourse that coincides with the responder's focus of attention; it is similar in function and syntax to a measure used with spoken discourse, the "idea unit" (Chafe, 1980; Gere & Abbot, 1985; Gere & Stevens, 1985) and to a measure used with written discourse, the

"communication unit" (Loban, 1963, 1976; Heath & Branscombe, 1985). "Comments" were marked, coded, and tallied in each of the eight peer response session transcripts.

Drafts collected from the writers were used in two ways. Prior to the interviews that followed the completion of each writing task, I prepared the final drafts of the paper for a discourse-based interview (Herrington, 1985; Odell & Goswami, 1982; Odell & Goswami, 1984: Odell, Goswami, & Herrington, 1983). Preparation involved comparing the first and final drafts for each writer. In each instance, I identified four changes made between the two drafts that brought the second draft closer to the desired end product, as described by the guidelines provided to writers prior to each writing task. Stimulus sheets for the interview juxtaposed the original choice and the revision for each sampled change on a new sheet of paper. Questions focused on writers' reasons for the changes made in the second draft. The interview questions were designed to determine the writer's rhetorical awareness as choices were made: the degree to which considerations of the audience (general or specific), the writer, the subject, or the text influenced specific wording and content selections. During the final interview writers were asked to state a preference for one of two modes of communicating for the purposes of a peer response session.

Additionally each final draft was evaluated by members of an editorial board using a holistic rating system (White, 1985). The results of the readers' ratings were analyzed to compare the quality of the final drafts by topic and mode of communicating prior to the preparation of the draft.

Data were collected from (a) the peer response sessions, (b) the follow-up interviews, and (c) students' actual compositions. The counterbalanced, repeated measures design allowed each group of five writers to serve as their own comparison group as the completed the two writing tasks required by the study while undergoing treatment at both levels of the independent variable: mode of communication.

The research design was a variation of the following:

R X O1 X O2

R X O1 X O2

With the exception of the measure of writer's preference for a single mode of communicating, observations were made twice on each dependent variable: amount of response, tone of response, content of response, tone/content combinations of response, reasons given for paper revisions made subsequent to peer response sessions, and the quality of the final drafts. Generally, comparisons of group means were made through an analysis of variance technique with two between factors--treatment order and topic order--and one within factor--treatment type. From the analysis an F-test was used to test the mean differences and interactions, with significance set at the .05 level of confidence.

Results

The transcripts of the peer response sessions provided data for four of the dependent variables of this study:

1. amount of response
2. tone of response
3. content of response
4. tone/content combinations of response.

Frequency counts of the individual units of response--the "comments"--received by the individual writers were tallied and categorized. For each of the four measures of response, three counts were established: (a) the initial number of comments, (b) the subsequent number of comments, and (c) the sum of these two counts to determine the total number of comments.

The subtotals of initial and subsequent comments were required to clarify comparisons across communication modes. In each kind of session--face-to-face or electronic mail--writers received an initial response from members of the group as they took a specified turn responding. Subsequent comments occurred during general discussions following the turn-taking. Comparisons between the sub-totals provide additional information about differences in patterns of responding between the two modes of communicating. The kinds of comments made by writers in each tone and content category are illustrated in Figure 1.

Amount of Response

Comparisons of the mean numbers of comments received by writers indicate trends that predominate in many of the comparisons of comments by tone and content (See Table 1).

Figure 1
Examples of Content and Tone of Response Received in Peer Response Sessions

Positive Response:
1. Just overall I like the way you set up your problem.
2. I like the example here, "Can you imagine all the phone calls from angry parents?"

Negative Response:
1. I don't think that's really clear to me.
2. Your first sentence turned me off.

Neutral Response:
1. Here is my summary.
2. And then you talk about the need for practice.

Evaluative and Generalized Response:
1. And the language is vivid.
2. I think that's really effective all through the whole paper.

Substantive and Text-Specific Response:
1. If you were to begin with "but how do you get effective small groups" it would throw us right into the topic.
2. I was a little confused by your assumption in the last paragraph.

Other Response:
1. I apologize for being so late in responding to your paper.
2. I think the English Journal would probably stick in a paragraph.

Table 1

A Summary of the Effect of Mode of Communication on the Initial, Subsequent, and Total Numbers of Comments for the Measures of Amount, Tone, and Content of Peer Response

Peer Response Measure	Mean Number of Comments		
	Initial	Subsequent	Total
AMOUNT			
E-Mail	86.8	5.5	92.2
Face-to-Face	65.2 ***	27.6 ***	92.8 ns
TONE			
Positive			
E-Mail	13.7	2.0	45.7
Face-to-Face	37.4 ns	12.4 ***	49.8 ns
Negative			
E-Mail	4.0	.6	4.6
Face-to-Face	3.3 ns	7.6 ***	10.8***
Neutral			
E-Mail	39.1	2.9	42.0
Face-to-Face	24.7 ***	7.7 **	32.3**
CONTENT			
Evaluative & Generalized			
E-Mail	16.7	1.5	18.1
Face-to-Face	9.7 **	4.2 *	13.9 ns
Substantive & Text-Specific			
E-Mail	33.4	.1	34.3
Face-to-Face	35.2 ns	12.5 ***	47.7**
Other			
E-Mail	36.8	3.1	39.8
Face-to-Face	20.9 ***	10.4 ***	31.3**

* $p < .05$ ** $p < .01$ *** $p < .001$

Writers received a greater number of comments in initial turns in electronic-mail sessions; conversely, they received a greater number of comments in subsequent turns in face-to-face sessions. When the numbers of comments are summed across turns, no general effect exists. Writers received equal numbers of total comments in electronic-mail and face-to-face sessions.

Tone of Response

When comparisons of the tone of the response are made, similar patterns emerge, as illustrated in Table 1. Writers received a greater number of positive, negative, and neutral comments in subsequent turns in face-to-face sessions. In initial turns, writers received a greater number of comments that were neutral in tone in electronic-mail sessions than in face-to-face sessions, but there were no differences in the number of positive and negative comments. The total number of positive comments received by writers did not differ for the two modes, but there were more negative comments in face-to-face sessions and more neutral comments in electronic-mail sessions.

For both modes of communicating, the total number of positive comments received greatly outnumbered the total number of negative comments received. In electronic-mail sessions, writers received significantly more positive comments than negative ($F=339.53$, $p<.001$). In face-to-face sessions, writers also received a significantly greater number of positive comments than negative ($F=284.57$, $p<.001$).

Content of Response

Comparisons of the content of the comments reveal trends similar to those observed in the numbers of comments received by

writers and the tone of those comments (See Table 1). Again, writers received greater numbers of comments of all content categories in the subsequent turns when responding face-to-face. In the initial turns of responding, writers received a greater number of evaluative and generalized and other comments in electronic-mail sessions than in face-to-face sessions. There was no difference in the number of substantive and text-specific comments received. The total number of evaluative and generalized comments received did not differ for the two modes, but writers received more substantive and text-specific comments in face-to-face sessions and more comments classified as other in electronic-mail sessions.

For both modes of communicating, the total number of substantive and text-specific comments received outnumbered the total number of evaluative and generalized comments received. In electronic-mail sessions, writers received a greater number of substantive and text-specific comments than evaluative and generalized comments ($F=26.47$, $p<.001$). In face-to-face sessions, writers also received more substantive and text-specific comments than evaluative and generalized comments ($F=17.50$, $p<.001$).

Tone/Content Combinations

As reported in Table 2, the comments reflecting particular combinations of tone and content were also compared across the two modes of communicating. Patterns surfaced in the initial and subsequent turns of responding. When mode of communicating had an effect on initial numbers of comments, electronic mail was favored; when the mode of communicating had an effect on subsequent numbers of comments, face-to-face was favored.

Table .2
A Summary of the Effect of Mode of Communication on the Initial, Subsequent, and Total Numbers of Comments for the Measure of Tone/Content Combinations

Peer Response Measure	Mean Number of Comments		
	Initial	Subsequent	Total
TONE/CONTENT			
Positive/Evaluative & Generalized			
E-Mail	14.3	1.0	15.3
Face-to-Face	8.7 *	2.5 ns	11.2 ns
Negative/Evaluative & Generalized			
E-Mail	2.0	.3	1.5
Face-to-Face	1.2 ns	1.3 ns	1.9 ns
Neutral/Evaluative & Generalized			
E-Mail	1.2	.2	1.3
Face-to-Face	.5 ns	.4 ns	.8 ns
Positive/Substantive & Text-Specific			
E-Mail	27.5	.6	28.1
Face-to-Face	26.3 ns	7.1 ***	34.5*
Negative/Substantive & Text-Specific			
E-Mail	2.6	.3	2.9
Face-to-Face	2.6 ns	4.8 ***	7.3**
Neutral/Substantive & Text-Specific			
E-Mail	3.3	.1	3.4
Face-to-Face	4.7 ns	1.2 ***	5.9*
Positive/Other			
E-Mail	1.9	.4	2.2
Face-to-Face	2.8 ns	3.0 ***	5.8*
Negative/Other			
E-Mail	.2	.5	.3
Face-to-Face	.1 ns	1.5 **	1.6**
Neutral/Other			
E-Mail	34.7	2.7	37.4
Face-to-Face	18.0 ***	6.0 *	23.9***

* $p < .05$ ** $p < .01$ *** $p < .001$

In initial turns of responding, the electronic-mail sessions allowed writers to receive a greater number of positive/evaluative and generalized comments and neutral/other comments than in the comparable portions of face-to-face sessions. For no other tone/content combination did electronic-mail responding offer an advantage over face-to-face sessions in numbers of comments received in initial turns. For all other categories of comments, mode of communication had no effect in initial turns.

In subsequent turns, mode of communicating had an effect on six of the categories of comments. Writers received greater numbers of all kinds of substantive and text-specific comments and other comments in face-to-face sessions than in electronic-mail sessions. The numbers of various evaluative and generalized comments received did not differ for the two modes of responding.

The comparisons of the total number of comments received by writers generally reflected the patterns established in the initial and subsequent turns of responding. Writers received a greater number of all kinds of substantive and text-specific comments in the face-to-face sessions than in the electronic-mail sessions. More positive/other and negative/other comments were also received face-to-face than by electronic mail. Only in the category of neutral/other comments did electronic mail provide writers with a greater total number of comments.

Follow-Up Interview Results

The transcripts of the follow-up interviews provided data for two of the dependent variable of the study: reasons that writers gave for paper revisions made subsequent to each of the

peer response sessions and writers' preference for a mode of communicating.

Writers' Reasons for Revisions

Writers' mode of communication had no general effect on five of the six kinds of reasons for revisions (See Figure 2), but writers gave more subject focused reasons for their revisions in papers written after face-to--face sessions (mean=2.2 vs. 1.0, $F=17.61$, $p<.001$). Writers identified the influence of peers--group-specific audience focused reasons--with equal frequency following each kind of peer response session.

Writers' Preference for Mode of Communication

Each writer's preference for a mode of communication--electronic mail or face-to-face--was determined from the replies to the final question in the second follow-up interview. Their replies are summarized in Table 3.

Three significant preference differences were found. The total group of subjects preferred face-to-face communication (.60 vs. .35, $z=2.27$, $p<.05$). Subjects also preferred face-to-face communication if they participated in face-to-face sessions first (.70 vs. .20, $z=3.125$, $p<.01$) or participated in a face-to-face session first and wrote on Topic #1 (groups topic) first (.80 vs. .0, $z=3.64$, $p<.001$).

Holistic paper rating results

The composite ratings for each paper, agreed upon by two raters, were analyzed. The results of the statistical tests reveal no effect of mode of communication, treatment order, or topic order on the ratings of the papers. The papers written after each kind of session were of comparable quality.

Figure 2
Examples of Writers' Reasons for Revisions

General Audience Focused Reasons:

1. I did the ballot option saying these could be secret and that gave some options so if the teacher felt the kids would feel intimidated they could just do the ballot. Otherwise they could do the other one.
2. I think so. Yeah I think so, a little clearer. The reader might not wonder as to what I mean or what I meant by that.

Group-Specific Audience Focused Reasons:

1. In the feedback people asked, they wanted to hear more about Gordon instead of casually introducing him.
2. There were several comments from e-mail that I could tighten up that I said about honesty so I just tried to make my points that I did in the original just more compact in the revision.

Writer Focused Reasons:

1. A lot of times I like to just end it, but I like this better.
2. So the reason I did that was to tie it in with that quote I decided that I liked.

Subject Focused Reasons:

1. I didn't develop the three "time, practice, and diversity" and I felt that "practice" could be adequately incorporated into the "time" section.
2. The reason I put the theoretical and the real is in the sentence or two before I made that distinction between the dilemmas, theoretical and real, so I put an example of each one.

Text Focused Reasons:

1. I think just as far as a general revision for the paper I wanted to cut the paper down in size. I felt the first copy was just too long.
2. And the original seems awkward to me, too. I don't like using "thus" too much.

Other Reasons:

1. Well, the first time, I just, it was getting late, and I just typed it, and didn't do paragraphs.
2. I figured rather than worrying about that I would worry how to teach reading.

Table 3
Frequencies: Writers' Preference for Mode of Communicating

Treatment Order	Topic Order	Preference		
		E-Mail	Face-to-Face	Neither
		Frequencies		
E-Mail 1st	Topic #2 1st (groups topic)	2	3	0
E-Mail 1st	Topic #1 1st (values topic)	3	2	0
Face-to-Face 1st	Topic #2 1st (groups topic)	2	3	0
Face-to-Face 1st	Topic #1 1st (values topic)	0	4	1
Total Frequencies		7	12	1
Proportion of Total Subjects		.35	.60	.05

Ratings assigned to the papers on Topic #1 and Topic #2 were compared with a direct difference method t-test for correlated measures. The results of this test indicate that the mean ratings for the Topic #1 (values) papers were significantly higher (mean=3.2 vs. 2.95, $t=7.11$, $p<.001$).

Correlations were calculated for the various total measures of peer response and the composite paper ratings for each mode of communicating. The only measure of response that bore a significant relationship with the paper ratings was the total number of negative evaluative and generalized comments received on electronic mail. The inverse relationship ($r=-.4601$, $p=.041$) indicates that as writers received a greater number of negative evaluative and generalized responses on electronic mail, the composite ratings for their papers submitted after electronic-mail response declined.

Discussion

The Amount of Response

The data indicate that the total numbers of comments received by writers in the two modes of communicating did not differ. The significant differences in the two modes can be found in the numbers of comments writers received in the initial and subsequent turns. The greater number of electronic-mail comments in the initial turns of responding and the greater number of face-to-face comments in the subsequent turns of responding may be explained in at least two ways.

Differences in numbers of comments at the initial and subsequent turns may be a function of time. The initial turns of

face-to-face sessions were timed, with each responder limited to two minutes. The initial turns of electronic-mail sessions were not timed. Electronic-mail responders could provide fellow writers with their summarizing, pointing, and telling comments the first time they logged on without a timer's interruption. In face-to-face sessions, the timer (the fifth reader) often interrupted the responder's initial turn comments; any additional comments were delayed until the general discussion portion of the session. Face-to-face comments occurring during the general discussion were tallied as subsequent turn comments; they may in part consist of the comments left unsaid in the initial turns. Electronic-mail responders may have exhausted their commentary in the initial turns, not requiring the subsequent turns--logging on again--to complete their response. The equal numbers of total comments received by writers in the two modes may indicate that response to a 250-350 word paper consists of a mean of 92 some comments and that the only difference in the two modes is when the writers received the comments.

Another factor which may contribute to a greater number of comments in the subsequent turns of face-to-face sessions is the interactive nature of spontaneous conversation typical of the general discussion portions of these sessions. As responders made comments in the general discussion, other writers elaborated on those comments or expressed thoughts previously unarticulated. Response generated response. In electronic-mail sessions, some writers never again logged on or logged on only a limited number of times to generate interactive discussion in subsequent turns of electronic-mail responding. As a result, the subsequent turns

on electronic mail did not consistently spark the piggybacking of ideas made easier by the immediate and simultaneous response in a face-to-face general discussion. Some electronic-mail responders opted out of the general discussion; the advantage that electronic mail had for providing more comments was not realized. The lack of interaction among the responders may explain why.

Tone of the Response

The tone of the session's response provides one indicator of its effectiveness. The data collected from these sessions indicate that the number of positive and encouraging comments (effective response) outnumbered the negative comments for both modes of communicating. To differing degrees, both kinds of peer response sessions were productive of comments that can be considered effective in tone.

The positive comments are in part attributable to the way in which the session procedures structured writers' response. As expected, the face-to-face responders' comments were shaped by the session procedures (Freedman & Bennett, 1987). Ample opportunities for writers to build a community on electronic mail sustained the procedures in those sessions, preventing the hostile or aggressive messaging that sometimes characterizes computer messaging (Brotz, 1983; Kiesler, Siegel, & McGuire, 1984).

A comparison of the initial neutral comments illustrates another way in which the session structure influences writers' commentaries. Electronic-mail responders provided a greater number of these summaries or paraphrases than face-to-face responders. Face-to-face responders, who heard each others'

initial response, sometimes tired of summarizing, seeing additional paraphrases as repetitive. They then moved quickly to the pointing and telling remarks. Electronic-mail responders, who did not "hear" each others' initial response, were more likely to adhere strictly to the summarize, point, and tell formula. As a result, writers received more neutral comments in the initial turns of electronic-mail sessions than in face-to-face sessions. While Freedman does not label these as effective responses, Lamberg (1980) has noted the informative value of paraphrases and summaries. They let writers know how well they have communicated. Without the initial summary comments, groups like the ones observed by Freedman and Bennett (1987) may devote only a small percentage of their comments to the substance of a paper, especially when dittoed editing sheets focus attention on non-substantive features. Neutral/other comments, while not effective in and of themselves, may serve an important focusing function, building the conceptual framework upon which the essential evaluative comments rest.

In general, face-to-face participants received a greater number of negative comments than the electronic-mail participants. Comments negative in tone may prove the least effective to writers, although students may perceive negative criticism as the most effective (Freedman & Bennett, 1987) due to the model of teacher-provided response (Gere & Stevens, 1985). The actual number of negative comments received were so small as to seem insignificant. Contrary to expectations that writers might be more blunt on electronic mail because they are not

facing the author (Kinkead, 1987), these responders were generally positive. In face-to-face sessions, when writers invited negative criticism, responders believed the author and provided it. The trust level was established quickly and response, as one writer observed, "evolved quickly" to more constructive forms. Another writer commented, "I think you can be more critical face-to-face because you can explain why better because you have voice intonation and they can hear your sympathies."

Content of the Response

Those who compare the relative generality of teachers' comments on students' papers with the more specific advice and commentary provided by students corroborate the notion of effective response as that which refers to specific, substantive features of the author's paper (Gere & Abbot, 1985; Gere & Stevens, 1985; Hillocks, 1986; Searle & Dillon, 1980; Sommers, 1982).

Both modes of responding produced a greater number of substantive and text-specific comments for writers than purely evaluative and generalized comments. Writers received more substantive and text-specific comments in face-to-face sessions than in electronic-mail sessions, primarily because of the greater number of comments received face-to-face in subsequent turns. At the subsequent turns, writers received virtually no substantive and text-specific comments in electronic-mail sessions. Again, electronic-mail responders provided the bulk of their comments to writers in the initial turns, including the "other" kinds of comments--usually summary comments.

Tone and Content Combinations of Response

Effective response, as described by Freedman (1984) is positive and encouraging in tone and substantive and text-specific in content. Comparisons of this kind indicate that writers received greater total numbers of these effective comments in face-to-face sessions than in electronic-mail sessions, largely because of the significant differences in subsequent turn responding. Characteristically, writers received more positive-substantive and text-specific comments in the subsequent turns of face-to-face sessions than in the subsequent turns of electronic-mail sessions. Electronic-mail responders did not compensate by providing significantly greater numbers of these comments in the initial turns; they simply failed to take subsequent turns to continue responding in a positive tone about substantive and text-specific features of the writing.

Effectiveness of response cannot be determined by surface features of response alone. The ultimate effectiveness of response lies in writers' attention to it--its contribution to the revisions they make, the resultant quality of the papers they revise, and writers' perception of its effectiveness.

Writers' Reasons for Revisions

Only one kind of reason differed for the papers written after the two modes of communicating--subject focused reasons. All other categories of reasons were equal for the two kinds of peer response sessions.

These results may indicate a focus on comments in the face-to-face sessions on the paper topics or indicate the writers' attention to the paper topic with less regard for audience

considerations. After both kinds of sessions, writers attributed equal numbers of revisions to considerations of a general audience and their specific peer group. If these reasons can be taken as an indicator of the influence of the peer groups, then in each mode of communicating, the peer group response had an equal influence on the writers' revisions. As they were interviewed, writers illustrated memory of the peer groups' advice. The interview data do not indicate writers' greater reliance on the peer response in one mode as opposed to another, when making revisions. Without more direct comparisons of the response and the revisions, the interpretations of this data are not conclusive.

Writer's Preference for Mode of Communication

In general, writers preferred face-to-face responding. The reasons that writers provided for their preferences indicate some of the factors that cause writers to prefer one mode to another: convenience, time, and perceived quality of the response received. Each of the factors could result in a writer preferring electronic-mail or face-to-face responding. Some individuals wanted to prolong the responding time; others wanted to compress it. Some writers preferred to give spontaneous response face-to-face; some liked to formulate their response more carefully and put it in written form on the computer. For some students the computer communications were more convenient than scheduling group meetings; for other students the need to walk to the computer lab was an inconvenience. Few individuals saw electronic mail as totally useless; Group 4, the only group to state a majority preference for face-to-face responding, had a

particularly dynamic face-to-face session when they first met. In their second session, the electronic-mail session, they did not follow the session procedures but instead logged on once to respond to everyone's paper and then did not log on again until the week was almost completed.

The number of students who made requests to keep their electronic-mail accounts--twelve of the seventeen students (71%) who continued as students at the university--is larger than the number of writers who stated a sole preference for electronic-mail responding. This may indicate the multiple uses to which electronic mail can be put; a liking for the mode may not be captured by requiring writers to make a single choice between face-to-face and electronic-mail communication.

Quality of the Final Drafts

That peer response can be effective in improving the quality of students' writing has been documented in studies as early as the 1890's (Gere, 1987). The results of this study indicate no difference in the quality ratings of the sets of papers for the two modes of responding represented here. To the degree that authors may have used peer response to improve their final drafts, the effect was the same for papers written after the two modes of responding.

Two factors limit the interpretation of the similarities in the mean ratings for the two sets of papers. First, by comparing the sets of papers by their time of completion, papers are being compared across topics; this comparison may hide real differences in the quality of the papers (White, 1985). Additionally, holistic scoring, while providing a reliable and valid indicator

of the general quality of the paper presents some measurement problems because the scores may cluster at the mid-point of the possible ratings (Hoetker, 1982). The mean ratings for the two paper sets cluster near a rating of 3, the midpoint for a 1-5 scale; again, real differences in writer's papers may be hidden by this characteristic of the measure used to evaluate the papers' quality.

Of course, there may be no real differences in the quality of the two sets of papers produced by the writers. To expect that one intervention--responding by electronic mail or responding face-to-face--would make a difference in the quality of two papers written by an author is expecting too much.

Treatment Order and Topic Order Effects

Although the analysis in this paper has focused on the effects of treatment type, the effects of treatment order and topic order may also prove important. Often the treatment order effect simply enhanced the mode of communication effect. In other words, writers received a greater number of a certain kind of comment in an initial turn of an electronic-mail session if they first participated in an electronic-mail session. Conversely, writers often received a greater number of a certain kind of comment in the subsequent turns of a face-to-face session if they first participated in a face-to-face session. The enhanced effect may have resulted from a novelty factor or fatigue.

Topic order had an effect on many measures of peer response. When numbers of comments differed by the order of topics, the greater numbers could always be attributed to one order: writing on the groups topic (Topic #2) first. How the topics may have

differed, since they were not selected to represent particular constructs, is not clear. The differences in the two topics, as perceived by the writers, and as reflected in the numbers of comments exchanged, warrants further research but is not a primary focus of this study.

The interaction effects found in the analysis of data are not reported here; their presence indicates however, that some of the general effects reported here may not hold for particular combinations of these variables.

Conclusions

This study, designed to determine the similarities and differences in the peer response that writers received in two modes of communicating, is prototypical for future uses of electronic mail as a "tool for communication" among writers. The results of this study and their interpretation suggest the issues to be considered in similar applications of electronic-mail communication. The implications for similar applications of electronic-mail communication center on two major issues:

Issue:

1. Face-to-face interactions and electronic-mail communications vary on several dimensions: the oral vs. written nature of the communication, single vs. multiple threads of conversation, the interactive vs. delayed nature of participation, and the fleeting vs. permanent record of the messages.

Implications:

The skills required to communicate successfully in electronic-mail sessions may differ from the skills necessary in

face-to-face sessions, especially, if as Spitzer (1986) has insisted, computer communicating is a new medium somewhere between writing and talking. He suggests this difference in communications competencies for computer-based communicators:

> The participants who send the most messages will not necessarily be the same individuals who are most outspoken in group meetings. Those people with powerful ideas will have more impact than those with powerful personalities. Those who write well and think clearly will write more notes and receive more positive feedback than those who merely like to hear themselves talk (1986, p. 20).

Electronic-mail communicators may require training in these writing/speaking skills to use the medium well. In turn, the medium offers additional opportunities for writers to hone these skills while providing response to others.

Simultaneous threads of discourse can cause confusion for electronic-mail communicators (Black, et al., 1983; Quinn, et al., 1983); the many topics introduced in electronic-mail conversations thread their way through the transcripts in seemly erratic patterns. Since writers do not log on simultaneously to respond to a single paper, the responses to an author's paper may be interspersed with responses to another paper, topical conversation, procedural questions, and acknowledgements to responses already received. To unravel the simultaneous threads, writers should be encouraged to provide more informative titles for their electronic-mail messages. I concur with a recommendation made by Katz, Mcswiney, & Stroud (1987)): the

system should assist informative titling by allowing writers to modify message titles after they have composed the message. Writers should also be encouraged to divide their messages by topic, even if they choose to write on a number of topics at a single on-line session.

Additionally, the role of moderator must be strengthened; the moderator of an on-line session should provide greater structure for the messages by occasionally summarizing the flow of the discussion, establishing a topic agenda, prompting participation on the topic(s) at hand, and organizing the meta-commenting directed toward changing electronic-mail conversation procedures (Bannon, 1986; Feenberg, 1986; Kerr, 1986). For the purposes of this study, the role of the moderator mimicked the non-intrusive role of the moderator in face-to-face sessions. To insure focused and lively participation, the teacher or students in a group must be prepared to provide energetic leadership.

Face-to-face interactions, unlike electronic-mail interactions, require the participants to be present in one time at one place. As a result, the frequency of interaction in face-to-face discussions is usually predetermined and controlled by the group; one person speaks at a time. In electronic-mail discussions the frequency of interaction is more subject to individual choice; many may take turns at one time or choose not to take turns at all. In an electronic-mail peer response group, passive members may "lurk"--reading others' comments but never providing comments for others.

To achieve a more sustained, interactive pattern of communicating on electronic mail, several factors should be

altered. First a stronger leadership role for the moderator might enhance participation in subsequent turns of responding. Second, writers should be encouraged to use electronic mail for purposes other than peer responding--transmitting documents, clarifying assignments--increasing the likelihood that they would continue to use electronic mail to provide response. Third, the telecommunications program used should allow for true computer conferencing capabilities, allowing a more public mode of discussion. An electronic-mail system that permits private messages and public conferences may prove the ideal combination to activate use and stimulate interaction.

The tools available to writers as they use electronic mail--printing capabilities, conferencing functions, document transmission--are important in defining what electronic-mail communication is. The writers in this study used a primitive system in terms of the tools available; downloading messages to create a hard copy of comments received was not easily accomplished. Further investigation is required to determine which advanced features of an electronic-mail system would prove most helpful to writers. However, the telecommunications program chosen should enable less experienced computer users to download the message file for their personal use in the form of hard copy; without that capability, electronic-mail environments lose one of their distinctive features.

Issue:

2. Other factors, independent of the distinctive characteristics of the mode of communication, influence how individuals use face-to-face and electronic-mail communications.

These include issues of convenience (time and access), skill and comfort levels, and motivation.

Implications:

Examination of writers' responding patterns and interview data reveal that the issues of time and convenience did not favor one mode of communication over another. While some writers found a single face-to-face meeting more convenient, others preferred the convenience of responding at a time of their choice. Some writers preferred to take more time to read and send comments and therefore chose electronic mail as the better method of responding. Contrary to expectations, those writers with home access to the electronic-mail network did not overwhelm their fellow writers with commentary. Their frequency of logging on and providing comments is comparable to others in their groups. The advantage of easy access was tempered by other unknown factors. I conclude that providing writers with easy access and time to use computer equipment and telecommunications software is desirable but not sufficient to insure use of electronic mail to provide peer response.

The writers in this study were given appropriate training, practice time, community building activities, and adequate technical help with their questions subsequent to the initial training period. Appropriate messages were modeled for them. Most of the writers participated actively in the scavenger hunt and the practice period messaging conducted on electronic mail. An electronic-mail community seemed to have been established among the twenty writers.

Several recommendations can be made based on these

observations. Writers should be encouraged to continue using electronic mail for a variety of purposes in addition to peer responding. Writers should have enough reasons to log on to insure frequent participation. Otherwise new skills are quickly forgotten, and the resulting embarrassment prevents some users from asking for the help they need.

Peer response groups function most effectively when they develop trust and are willing to risk others' opinions. Community building activities within the small group are essential. The initial training time consisted of conversations among all twenty writers; had that time been spend conversing with just the members of one's group--not yet assigned at that point in the study--participation levels might have been increased. In a more natural situation, groups could be trained to use e-mail and given similar group cohesion-building activities to engage in before being asked to function as a group to give response. In a classroom setting, self-selected groups may be preferred to assigned groups.

Turoff, Hiltz, & Kerr (1982) conducted a Delphi study to determine the most significant design factors in computer-mediated communications systems. They have concluded, "The degree of motivation to use a system is probably the primary factor in determining its success" (p. 98). The factors that motivate individuals to use electronic mail to provide peer response merit further study. Among these factors are the topics and tasks posed for discussion. Katz, et al. (1987) recommend that topics, for beginning electronic-mail communications, be tailored to the frequency with which participants are expected to communicate. An

activity-oriented topic, one that requires rapid information and group collaboration for completion, would exert pressure to log on. Williams' (1977) comparison of face-to-face and teleconferencing modes concluded that cooperative problem-solving tasks that required the exchange of information were most appropriate for teleconferencing modes of communication. Was the values topic, the topic that was most expansive in terms of students' comments and topic conversation, closer to this standard than the groups topic? Sampling of possible teleconferencing topics is an important area for further study.

As Governor Alexander has asked, "Why shouldn't schools use the newest technologies for learning?" This study tested the use of an emerging technology to facilitate peer group response during the writing process. Pitted against one another, face-to-face communication and electronic-mail communication generated comparable numbers of comments for writers, although differences were found in the quality of those comments. The power of Elbow's and Macrorie's modified responding procedures is evident in the predominance of effective response in both kinds of sessions. The next study of these tools should test the effects of electronic mail as a complement to rather than as a substitute for face-to-face communication. Future uses of the electronic-mail tool should enhance its distinctive characteristics and capitalize on the factors that influence writers' use of the tool to communicate.

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