Local Area Network (LAN) Computers in ESL and EFL Writing Classes: Promises and Realities

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Local Area Network (LAN) computers, used in writing classes in the U.S. for more than a decade, are now being introduced to colleges and universities in Asia. LANs have been observed to increase the quantity of writing and the degree of classroom interaction by students. However, research does not indicate that LANs are more effective in improving the writing of ESL and EFL students. Further, during peer reviews of papers, a context which usually generates the most collaboration, students in traditional classes have provided more feedback than students in LAN classes. Hence, LANs may be no more effective than traditional classes in improving the writing of ESL and EFL students.

ローカル・エリア・ネットワーク（LAN）は、アメリカの大学の作文授業では10年以上前から利用されているが、近年、アジアの国々での外国語授業へも導入されつつある。実際に英語を使って書く量が多くなり、学習者間の協力が盛んになるという理由で、英作文学習に効果的だといわれるLANであるが、作文の質的側面をみると状況が異なる。すなわち、LANを利用して書き上げた作文には、従来の教授法に従って書かれた作文ほどの質的向上がみられないのである。さらに、学習者間でお互いの作文を添削する場合、LAN利用の授業と比較して、従来型の授業の方が学習者はより盛んにフィードバックを送りあっていたことが判明した。英作文能力の向上のために、LANの利用が従来型の授業よりも効果があるとは、必ずしも結論付けできないようである。

Local area network (LAN) computers, used in American writing classes for about a decade, are now being introduced to Asia. More than a dozen universities and colleges in Hong Kong, Japan, Singapore, and Taiwan have installed LAN computers to teach writing in the past two years, and more installations are planned.[1]

A LAN consists of a number of computer terminals linked through a server. LANs are commonly used in businesses, laboratories, and industrial settings where employees at a single location need to be linked for the purpose of sharing information. Although the exchange of electronic information usually demands expertise in LAN management, software programs designed for educational settings have simplified the process for teachers and students so that LAN-based instruction can be conducted with only a basic knowledge of computers. A number of software programs for LAN writing classes exist and this report uses the *Daedalus* program (1994).

How LAN Software Works

Daedalus (1994), used by more than five hundred secondary and tertiary institutions in the U.S. and also gaining popularity in Asia, best illustrates how LAN software designed for writing classes functions. The software is capable of displaying two "windows" on each computer screen—one for private editing and the other for public viewing. The "messages" written by the teacher and students in the private editing windows of their computers appear on the public viewing window on every computer screen in the classroom. The writing on the public viewing window is called the "main" conference. Since the writing appears sequentially and can be scrolled on the computer screen, the teacher and students can be involved in a simultaneous discussion. The software program is also capable of running "sub-conferences," a third window that allows smaller groups of students, with or without the teacher, to hold simultaneous discussions separately from the main conference, with the option of joining the main conference. Thus, at any given time, the class could be involved in discussions on the main conference and a number of sub-conferences. In writing classes, sub-conferences are suggested to be especially suitable for peer review of papers in small groups of three or four students.

When computers were introduced to writing classes more than two decades ago, they were stand-alone versions and students sat in relative isolation using word processing programs. Although these programs made revision easier, interaction with other students and the teacher was not high and feedback on writing came mainly from the teacher. The introduction of LANs to writing classes about a decade ago led to a dramatic increase in student writing, interaction, and collaboration, and to more learner-centered classes.

Hypothetically, LANs hold much promise for second or foreign language learners because they have the following advantages over tradi-

tional teacher-centered writing classes that use methods such as oral discussions, lectures, and word processing. First, the real-time conferencing capability of LANs can promote better discussions because the lack of turn-taking allows all the students in a class to participate, eliminates interruptions, and facilitates immediate feedback by students and the teacher (see Kemp, 1993). Further, the negative effects of social context cues like skin color, gender, and age are eliminated in LAN discussions. In addition, second and foreign language learners who are generally less articulate orally than in writing, take more time to verbalize their thoughts, and are too polite to interrupt others, are also not disadvantaged (for a more detailed discussion of the positive effects of LANs in writing classes, see Cooper & Selfe, 1990). The anxiety caused by accents, another obstacle to free interaction in second and foreign language classes (see Price, 1991), is also eliminated by LANs.

As an example of how LANs promote student discourse, Figure 1 is an excerpt from a LAN discussion as it appeared in the public viewing window. The discussion on a paper titled, "Surviving in Cambodia" was conducted by Cantonese-speaking students enrolled in an EFL writing class at a Hong Kong university. Fourteen students, 4 male and 10 female, participated in this discussion, their first meeting on the LAN. The students contributed 99 messages during the total meeting time of 105 minutes, the female students sending 52 messages and the males 25; the balance of 22 messages were from the teacher. The highest number of messages sent by a student was eight, and the lowest was one, producing 100% student participation in the discussion.

This excerpt illustrates some distinctive features of a LAN writing program, such as the sequential appearance of messages, the identification of writers, and the prolific nature of writing. Cheung May's contribution, which appears at the beginning of the segment, is actually the 51st "message" in the discussion. The first message in the excerpt was sent at 11:39:58 and the final message at 11.41:28. Thus, within a period of 90 seconds, four students had contributed fairly long and thoughtful messages totaling more than 210 words (see Braine, 1998, for a detailed analysis of this LAN discussion).

Research on the Quantity and Quality of ESL/EFL Students' Writing with LANs

As seen from the transcript in Figure 1, perhaps the most remarkable and appealing features of LANs are the high volume of writing by students and their great degree of participation. These features have been documented repeatedly in ESL writing classes using LANs. For instance,

Figure 1: Excerpt from Transcript
of a LAN Discussion in an EFL Writing Class

11:39:58
Msg #51 Cheung Meimei May:
Although the writer tells his unhappy story in Cambodia, he writes it quite interestingly. The story is quite funny. However, I think the deep meaning in this paper not only tells us his story. It reflects the poor situation in Cambodia during the Communist rule. It is so sad to know that a nine year old boy always has to lie and steal in order to survive.

11:40:08
Msg #52 Judy Chan:
George, does the ILC have this film?

11:40:52
Msg #53 Ashley Ip:
The thesis is also very attractive to me because I have been living in a very peaceful place since I was born. It is very difficult for me to imagine how I can live if there is a war. And, I think this is also some experience that only few students have. Therefore I think the paper is attractive to everyone.

11:41:28
Msg #58 Cora Limleena:
"surviving in Cambodia" is an interesting paper.
First of all, the thesis statement is clearly stated in the first paragraph-"I survived through the entire four years by knowing how to lie and how to steal." This attract readers attention as we are all curious to know how and why!
Examples quoted are the writer's first hand experience and so it is more believable. However I am sorry that it is really a hard time for a nine-year-old boy to lie and to steal!

Markley (1992) observed that students in a 50-minute class wrote an average of 152 words, while in another 50-minute class the average student output increased to 188 words. Students in a 40-minute class taught by Sullivan (1993) wrote an average of 95 words. In a 50-minute class taught by Ghaleb (1993), each student wrote about 90 words. In a 100-minute class observed by Braine (1997a), in which students peer reviewed essays in small groups, the output was a remarkable 480 words per student. In another study, Braine (1997b) observed an average of 334 words written by EFL students during peer reviews in 100-minute classes. In all these classes, every student participated in the discussion

and at least 71% of the classroom interactions were between students, in sharp contrast to traditional language classes, where from 60-80% of the speech is attributed to teachers (Chaudron, 1988, pp. 50-53).

However, the effectiveness of LANs in ESL and EFL writing classes should not be determined by the quantity of writing or by the degree of student interaction alone. Considering the high cost of the technology, a primary criterion should be the enhancement of writing quality. Several studies have compared ESL students writing in LAN-based and traditional writing classes to determine which context is more effective in enhancing writing quality. Ghaleb (1993) compared 39 ESL students enrolled in two first-year writing classes in the US, one writing on a LAN and the other in a traditional setting. The students were from ten language backgrounds. Writing quality was determined by holistic scores awarded to the first and final drafts of final term papers by three raters using a 6-point scoring guide designed by the author. The interrater reliability in this study was .66.

Although the first drafts in the LAN class were of a higher quality, the final drafts in the LAN class showed only a mean improvement of .2 of a point, while papers in the traditional class showed a mean improvement of .8 of a point. Ghaleb attributed the difference to the considerable amount of time spent by the instructor of the traditional class on the teaching of grammar and error correction, whereas in the LAN class, the teacher and students spent class time interacting on the LAN.

Sullivan and Pratt (1996) compared 38 Spanish-speaking EFL students in Puerto Rico who were enrolled in their first writing course. One group of students held discussions and wrote on a LAN while the other group conducted these activities in a traditional setting. Again, writing quality was measured by the holistic scores of two raters on a 5-point scale designed by the authors. The interrater reliability here was not estimated. At the beginning of the semester, the mean score of papers in the traditional class was higher than the LAN group. However, by the end of the semester, the mean score of the traditional group had decreased by -.46 of a point. In the LAN class, the mean scores of papers increased by .07 of a point, a very small gain. However, a paired t-test showed the difference in the changes to be statistically significant ($p < 0.05$).

Braine (1997a) compared the writing of 69 students enrolled in first-year ESL writing classes in the U.S., some writing on a LAN and the others in traditional classes, over two academic quarters. The students were from ten language backgrounds. The first and final drafts of student essays were scored holistically by three raters using the 6-point TOEFL Test of Written English (TWE) Scoring Guide and the interrater reliability was .80. The mean scores of first and final drafts in LAN classes

were higher than the scores of the traditionally instructed group, although papers in the LAN classes improved less than papers in the traditional classes (.3 of a point compared with .4 of a point).

Another study by Braine (1997b) compared the writing of 87 Cantonese-speaker EFL students enrolled in LAN and traditional writing classes at a Hong Kong university. The comparison was repeated with six groups of students over three semesters. As in the previous study, the first and final drafts of student essays were scored holistically by three raters using the TOEFL Test of Written English (TWE) Scoring Guide. The interrator reliability here was .82. Although the mean score of the first drafts in LAN classes was higher than the mean score for the traditional group, the mean score of final drafts in traditional classes (4.54 points) was slightly better than in LAN classes (4.45 points), and, as in the previous study, writing in the traditional classes improved more, as determined by the holistic scoring method. However, a paired t-test showed that the improvements in the mean scores of both the LAN and traditional classes were statistically significant ($p < .05$). See Table 1 for a summary of the results of the four studies.

Table 1: Summary of Research Comparing Writing Quality in LAN and Traditional Writing Classes (Average Points* from Holistic Scoring)

| Study | LAN Classes | | Traditional Classes | |
	Points for Draft 1	Points for Draft 2	Points for Draft 1	Points for Draft 2
Ghaleb (1993)	3.4	3.6 (+.2)	3.1	3.9 (+.8)
Sullivan & Pratt (1996)	3.19	3.26 (+.07)	3.41	2.95 (−.46)
Braine (1997a)	5.3	5.6 (+.3)	4.8	5.2 (+.4)
Braine (1997b)	4.25	4.45 (+.2)	4.12	4.54 (+.42)

* The two Braine studies and the Ghaleb study had a maximum of 6 points; the Sullivan and Pratt study had a maximum of 5 points.

As for the effectiveness of LANs in enhancing writing quality, the results of these studies are at best inconclusive, and this finding is compounded by the lack of measures of syntactic complexity. In Ghaleb (1993) and Braine (1997b), the final drafts in traditional classes were of a higher quality than final drafts in LAN classes: Only in Braine (1997a) were final drafts in LAN classes of a higher quality. In fact, in three of the studies, (Ghaleb 1993; Braine 1997a; 1997b), the papers from the traditional classes showed more improvement from first to final draft. In Sullivan and Pratt (1996), the

opposite was observed: The papers in the traditional class actually declined in quality while the papers in the LAN class improved. Here, the first drafts in the traditional class were of a higher quality (3.41) than both first (3.19) and final drafts (3.26) in the LAN class, which brings into question Sullivan and Pratt's (1996) claim that the students in the LAN class showed a gain in writing due to the LAN.

Since the students in EFL writing classes were homogeneous first language speakers, as opposed to the ESL students, who were from diverse language backgrounds, the findings of Sullivan and Pratt (1996), who studied Spanish speakers, and Braine (1997b), who studied Cantonese speakers, are more relevant to the EFL context. As noted, the conclusions of Sullivan and Pratt (1996) do little to support the claim that LANs improve writing quality. Braine's (1997b) study indicates the opposite, that the writing of students in traditional classes improved more, albeit marginally (see Figure 2 for a comparison of the changes in scores between first and final drafts in LAN and traditional classes).

Figure 2: Comparison of Changes in Scores between First and Final Drafts in LAN and Traditional Writing Classes (Holistic Scoring)
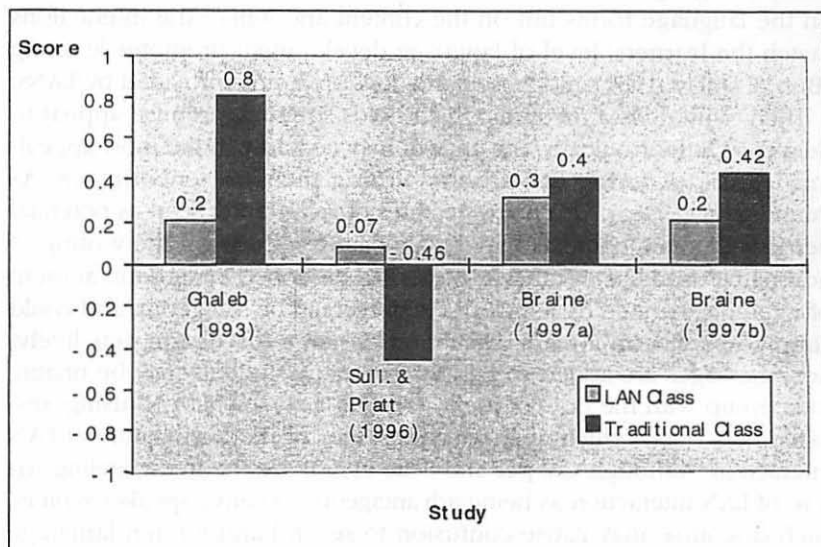
Sullivan and Pratt (1993) used a five-point scale. The other studies used six-point scales.

Discussion

The lack of clear empirical evidence indicating that LANs are more effective in improving writing quality is surprising in the context of research findings on writing and language learning[2] which suggest that the quantity of writing generated by LANs and the collaborative nature of the writing process should promote better writing (see Keim, 1989; Burns & Culp, 1980; Briere, 1966; and Gere, 1987, for effects of writing quantity and collaboration on writing quality). Research also indicates that learning environments which provide learners with opportunities for meaningful interaction and negotiation, and provide equal status with other learners and the teacher (i.e., learner-centered, communicative classes such as LANs) promote language learning (Pica, 1987, 1996). Further, according to research on second language acquisition, collaborative, information-exchange activities (Pica, 1987), "the opportunity to participate in the same kinds of interactions as naturalistic learners" (Ellis, 1984, p. 96), the absence of typical classroom discourse such as teacher initiation, student response, and teacher feedback (Ellis, 1984, p. 97), and the opportunity to actively participate in discussions without compulsion to produce until they are ready (Ellis, 1992, p. 48) are additional conditions which promote language learning in the classroom. Thus, a language environment where the focus of communication is not on the language forms but on the content and where the interactions match the learners' level of language development promotes learning (Burt & Dulay, 1981) and these conditions are amply provided by LANs.

Then, why does a medium which holds so much promise appear to deliver so little? Ironically, the answer may lie partly in the most appealing feature of LANs, the prolific writing their use encourages. As Pennington (1996, p. 26) notes, features of a computer seen as potential benefits in some contexts may have negative effects on the writing of non-native students in other contexts. As described earlier, the amount of writing generated by a LAN discussion could be staggering and could simply overwhelm a class discussion. When a discussion gets lively, new messages are added so rapidly that many students may be unable to keep up with the flow of ideas, creating a somewhat confusing, disjointed discourse which operates against the collaborative nature of LAN interaction. Although Cooper and Selfe (1990) see the freewheeling nature of LAN interaction as being advantageous to native-speaker writers, such discourse may cause confusion to second and foreign language writers struggling to express their ideas in a new language.

This phenomenon is best illustrated in Figure 3, which is another excerpt from the LAN discussion partially presented in Figure 1. The

discussion is now coming to an end and the students are giving their research paper topics to the group. Although Cora Limleena has indicated that she is leaving the discussion, the next message from Cheung May is directed at Cora. Apparently, each message was written simultaneously without an awareness of the other's contents, a situation which would have been avoided in a face-to-face discussion. The message from Ng Lei-Ling is a commentary on a paper discussed at the beginning of class and therefore has no relevance to the current discussion. The message from Shirley Yau indicates her inability to keep up with the discussion; she assumes that the computer is malfunctioning, although her confusion may actually be caused by incoming messages flooding the computer screen.

Figure 3: Excerpt from Transcript of a LAN Discussion
in an EFL Writing Class Showing Non-cohesive Discourse

12.01.02
Msg #88 Cora Limleena:
Bye everybody! See you all next time!

12.01.24
Msg #89 Cheung Meimei May:
Cora Limleena, we are lucky to live in Hong Kong. Therefore, we don't immigrate to other Asian countries as we cannot enjoy our women's rights.

12.02.04
Msg #90 Chong Ka-Yan:
I have chosen quite a different topic from the others. It's about multilevel marketing.

12.02.08
Msg #91 Ng Lei-Ling:
In my opinion, when the writer want to cite some examples or personal experiences, he had better present it clearly or give preparation for the readers to change their minds from the present situation in Russia.
Actually the data or information provided in this passage is quite abundant and valuable. But it seems that it can't concentrate on the core subject.

Msg #92 Shirley Yau:
Sorry, I can't receive your message.! I knew you had sent messages to other students! Are there any problems in my computer? James has the same problem too!

Interaction and Collaboration During Peer Reviews

Perhaps more than any other type of classroom activity, peer reviews provide language learners with opportunities for interaction and collaboration. This is due to the nonthreatening environment of small groups, the mutually beneficial and dependent nature of the task, the pressure to provide useful feedback within a time limit, and meaning-focused nature of the activity.

As mentioned, the most appealing features of LAN use are the great volume of writing generated and the increased participation and collaboration by students. However, this may not hold true during the peer review process. In one study comparing the quantity of writing generated in peer reviews (Braine, 1997b) in traditional classes and LAN classes, the traditional classes promoted more feedback, determined by a word count, than the LAN class. In 100-minute peer review sessions, students in traditional classes provided an average of 694 words of verbal feedback, the median being 592. However, in LAN classes each student only wrote an average of 334 words, the median being 337.

An analysis comparing the peer review process in traditional and LAN classes (Braine, 1997b) found differences in student discourse patterns and behavior. Students in traditional classes showed an orderly sequence of turn taking, providing feedback in narrative form, with the whole draft being critiqued. There were instances of meaning being negotiated, the feedback indicating a careful reading of drafts and a holistic approach to the peer review. Writers responded immediately to the comments of peers, justifying and explaining the points being critiqued. Another noteworthy feature was that students in traditional classes made prudent use of the limited time allocated to the peer reviews, agreeing on whose draft to review first and proceeding smoothly from one draft to the next. The proximity of the students sitting in groups and the face to face nature of the interaction may have made this possible. Despite the fact that they conversed in English, a language they would rarely use for communication outside English language classes, these transcripts showed evidence of carefully wrought, useful feedback.

In contrast to the thoughtful nature of the feedback observed in the traditional classes, feedback in the LAN class appeared to be sporadic, scattered, and less organized. It also appears to have been less planned. While the face-to-face reviews in traditional classes compelled all students to be alert and active participants, the lack of eye contact and physical proximity between students writing on the LAN mitigated against careful feedback. Some students appeared to be oblivious to the computer interactions of their peers, instead writing extended comments on essays selected arbitrarily, not by consensus.

In fact, the quantity of peer feedback in the traditional classes in Braine (1997b) exceeded the quantity in LAN classes. When compared to written peer reviews on LANs, the quantity of verbal feedback was greater in all but one of the 14 peer review groups in traditional classes observed over three semesters.

Conclusion

When word processing was introduced to writing classes, it was greeted with the euphoria that accompanies most high technology innovations to language teaching. But, after a more than a decade of use, Pennington (1993) notes the lack of clear evidence that word processing actually improves student writing, a caution echoed in more general terms for all CALL (Milton, Smallwood & Purchase, 1996).

Could the same be said of LANs? In a comprehensive survey of research on computers and composition, Eldred and Hawisher (1995) argue that no empirical evidence supports the view that computer networks enhance writing quality. Although this research examines the writing of English native speakers, the research surveyed here on second and foreign language writing classes, offers no evidence to contradict this view.

Technology is expensive and time-consuming. The dynamic nature of LANs and their high productivity will no doubt appeal to language teachers weary of traditional classrooms where students sit in comparative silence and isolation. Nevertheless, the reality appears to be that LANs may be no more effective than traditional classes in improving the writing quality of English as a second/foreign language learners.

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Notes

1. Susan Meigs, The *Daedalus* Group, Inc. (personal communication. July 6, 1998).
2. Pennington (1996) claims that a "causal link between writing more and

writing better (on computers) has not been established" (p. 81). However, her claim relates to word processing, which many network theorists such as Barker and Kemp (1990) have argued is radically different from LANs.

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