

Appendix A.

General Overview of Articles and Categories

Article Id	Technology	Ed Setting	*	Research Design	Lang Taught Native Lang.	Writing Task	Variables Under Investigation
1 n = 46	Synchronous CMC	Tertiary	Q	Within-subjects Design	German English	Writing	Participant roles
2 n =85	Multi-media	Tertiary	P	One-group Pre-Post Tests	ESL Arabic	Note-taking Report-writing	Writing Quality
3 n =113	Web/Internet/email; Word processor	Tertiary	Q	Pre-Posttest Control Group	ESL Arabic	Essay writing	Writing Quality Student Attitude
5 n =?	Synchronous CMC	Tertiary	N	Analysis of transcripts Interviews/questionnaires journals Researcher/teacher observation	French English	Class discussion	Writing Quality Patterns of discourse Student Attitude
6 n =49	Word processor Email	Tertiary	Q	Within-subjects Design	EFL Korean Arabic Thai	Essay writing	Text length Cohesive features
7 n =14	Email Word processor	Tertiary	N	Analysis of writing	ESL Many	Academic writing	Writing Quality Cohesive features Text length
8 n =26	Email	Tertiary	N	Analysis of transcripts	ESL Many	Composition	Rhetorical strategies Task relevance
9 n =11	CommonSpace	Tertiary	N	Questionnaires Interviews	ESL	Composition	Student Perceptions
10 n =48	Multi-media	Tertiary	E	Factorial Experimental Design Questionnaires	Spanish	Writing	Writing performance Task relevance Motivational strategy integration Student Attitude

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11 n =87	Computer-networked environment Word processor Tertiary	Q	Pre-Posttest Control Group	EFL Chinese	Academic writing	Writing quality Peer review Improvement in writing quality
12 n =69	Computer-networked environment Word processor Tertiary	Q	Pre-Posttest Control Group	ESL Many	Composition	Writing quality Peer review Improvement in writing quality
13 n =48	Computerized text analyser Polytech	Q	Pre-Posttest Control Group Interviews/questionnaires Computer logs	ESL Chinese	Essay writing	Writing performance Text Length Type of revision
14 n =20	Word processor Tertiary	E	Within-subjects Design	Japanese English	Writing	Writing quality Writing efficiency
15 n =103	Web-based interactive tool Secondary	Q	Posttest-only Control Group Questionnaire	EFL Chinese	Writing	Writing performance Writing apprehension Student Perceptions
16 n =32	Word processor Computer-mediated discussion Tertiary	P	Within-subjects Design Questionnaire	ESL Many	Composition	Peer review Student Perceptions
17 n =38	Email Tertiary	N	Questionnaire Interviews	EFL Danish Japanese	Writing	Cross-cultural understanding Student Perceptions Student Motivation
18 n =15	Computer-networked environment Tertiary	E	Pre-Posttest Control Group Questionnaire	German English	Writing	Structural adequacy Technical adequacy Student Motivation
19 n =20	Word processor Concordance Tertiary	Q	One-group Pre-Post Tests Questionnaire	EFL Chinese	Writing	Grammatical accuracy Student perceptions
20 n =?	Computer-networked environment Tertiary	N	Analysis of writing Examination of computer logs Non-participant observation	ESL	Writing	Text Length Writing quality
21 n =50	Email Tertiary	N	Analysis of writing	Spanish English	Writing	Language functions used

Article Id	Technology	Ed Setting	*	Research Design	Lang Taught Native Lang.	Writing Task	Variables Under Investigation
22 n =30	Email	Tertiary	Q	Posttest-only Control Group Survey/questionnaires	Spanish English	Dialogue journaling	Grammatical accuracy Lexical accuracy Quantity of writing Student Perceptions
23 n =20	Synchronous CMC	Tertiary	Q	Within-subjects Design Analysis of writing Analysis of transcripts Questionnaire	ESL	Composition	Writing performance Student Attitude Thinking styles
24 n =48	Word processor	Primary	Q	Pre-Posttest Control Group	ESL Spanish	Writing	Writing achievement Text length Effectiveness of revision Student Attitude
25 n =?	Word processor	Tertiary	N	Analysis of writing	ESL	Writing	Writing quality Writing process Time on task
26 n =17	Computer-mediated discussion	Tertiary	N	Analysis of transcripts Interviews Questionnaire	EFL Chinese	Composition	Pre-writing discussion Student Perceptions
27 n =13	Synchronous CMC	Tertiary	E	Factorial experimental design Interviews/questionnaire/journals Researcher/teacher observation	ESL Many	Academic writing	Modes of feedback Student Perceptions
28 n =5	Web-based interactive tool	Tertiary	N	Case Study	ESL Turkish	Writing	Student Attitude Interaction Keyboarding skills
29 n =15	Word processor	Tertiary	N	Analysis of transcripts Questionnaire	EFL	Essay writing	Type of revision
30 n =8	Word processor Grammar checker	Tertiary	Q	One-group Pre-Post Tests Interviews/questionnaire/journals	ESL	Composition	Writing quality Text length Student Perceptions
31 n =2	Word processor	Tertiary	N	Case Study	ESL	Writing	Revision strategies
32 n =17	Word processor	Secondary	E	Posttest-only Control Group	ESL Chinese	Composition	Writing quality

Article Id	Technology	Ed Setting	*	Research Design	Lang Taught Native Lang.	Writing Task	Variables Under Investigation
33 n =6	Word processor	Tertiary	Q	Within-subjects Design Interviews/questionnaires Computer logs	ESL Korean	Essay writing	Writing quality Pre-writing time Student Perceptions Composing processes
34 n =19	Word processor Web/internet/email	Tertiary	Q	Interviews/questionnaires Computer logs	EFL	Academic writing	Interaction Communicative competence Student Motivation Student Attitude
35 n =1	Word processor	Tertiary	N	Case Study	ESL Chinese	Essay writing	Writing quality Frequency of revision Thinking process Type of revision
36 n =22	Email	Tertiary	N	Analysis of transcripts Questionnaire	ESL Many	Academic writing	Grammatical accuracy Lexical complexity Syntactic complexity Rhetorical strategies
37 n =19	Computerized writing conference	Tertiary	E	Between-subjects Design	ESL Korean Japanese	Writing	Syntacticization
38 n =33	Web/Internet	Tertiary	E	Pre-Posttest Control Group Questionnaire	EFL Chinese	Writing Reading Vocabulary	Writing quality Student Attitude Vocabulary development
39 n =33	Grammar checker	Tertiary	Q	Pre-Posttest Control Group Questionnaire Ethnographic study	EFL Chinese	Grammar &Writing	Grammatical accuracy Writing performance Student Perceptions
40 n =15	Web/Internet	Tertiary	N	Analysis of transcripts Questionnaire	EFL Chinese	Composition	Citation strategies Writing performance Student Attitude
41 n =42	Drill & practice computer software	Tertiary	E	Pre-Posttest Control Group Questionnaire	EFL Chinese	Grammar &Writing	Writing quality Grammatical accuracy Student Attitude Student Perceptions

Article Id	Technology Ed Setting	*	Research Design	Lang Taught Native Lang.	Writing Task	Variables Under Investigation
42 n =48	Word processor MOO Tertiary	Q	Between -subjects Design	ESL Many	Composition	Peer review Effectiveness of revision
43 n =218	Word processor Asynchronous CMC Tertiary	N	Analysis of writing Interviews/questionnaires	EFL Japanese	Essay writing	Modes of feedback Writing quality
44 n=21	Association machine Tertiary	N	Analysis of transcripts Written reflections	ESL	Communicative competence	Student Perceptions
45 n=5	Système-D Tertiary	N	Case study Questionnaire Computer logs Video observation	French English	Composition	Revision strategies
46 n=175	Computer-based writing program Secondary	Q	Analysis of writing Questionnaire	ESL	Writing	Writing performance Student Attitude
47 n=19	Synchronous CMC Tertiary	E	Design Experiment	EFL Chinese	Essay writing	Writing quality Discussion quality Participation
48 n=4	Word processor Text-Critiquing Programs Tertiary	Q	Between -subjects Design Questionnaire	ESL Chinese Korean	Composition	Type of revision Text length Student Attitude
49 n=45	Word processor Tertiary	N	Questionnaire	ESL	Composition	Writing apprehension Student Attitude
50 n=4	Word processor Tertiary	N	Case study	ESL Spanish	Composition	Type of revision
51 n=15	Word processor Tertiary	E	Between -subjects Design	ESL Spanish	Writing	Proofreading skill
52 n=96	Word processor Spelling checker Secondary	N	Pyramid-structured Design	ESL Danish	Writing	Writing process
53 n=18	Word processor Secondary	N	Pyramid-structured Design Case study	ESL Danish	Writing	Writing strategies
54 n=21	Système-D Tertiary	N	Case study Computer logs	French English	Composition	Writing process

Article Id	Technology	Ed Setting	*	Research Design	Lang Taught Native Lang.	Writing Task	Variables Under Investigation
55 n=66	Word processor	Secondary	Q	Pre-Posttest Control Group Questionnaire	ESL Many	Composition	Writing quality Self-esteem
56 n=163	Web/Internet	Tertiary	N	Analysis of writing Interviews/questionnaires	EFL Japanese	Academic writing	Citing Web sources Student Perceptions
57 n=19	Computer-networked environment	Tertiary	N	Written reflections	EFL Korean	Writing	Student Perceptions
58 n=4	J Edit Trace-it	Adult Education	N	Case study Interviews Computer logs Participant observation	EFL Swedish Portuguese	Writing	Student Perceptions Student-computer interaction
59 n=38	Computer-networked environment	Tertiary	Q	Pre-Posttest Control Group Analysis of transcripts	ESL Spanish	Composition	Writing quality Student attitude Student anxiety
60 n=23	Word processor	Tertiary	N	Analysis of writing Questionnaire	EFL	Technical writing	Writing quality Writing apprehension Student attitude Revision strategies
61 n=3	Email	Primary	N	Case study	Spanish English	Writing	Writing strategies
62 n=10	Email	Tertiary	N	Case study Interviews Participant observation	ESL Chinese Indonesian Japanese	Dialogue journaling	Language functions used Student attitude Instructor's perceptions
63 n=167	Word processor Web/Internet/email	Tertiary	N	Survey Questionnaires	ESL/EFL Chinese	Academic writing Composition Technical communication Advanced Grammar & Composition	Student attitude Student motivation

* E = Experimental; N = Non-experimental; P = Pre-experimental; Q = Quasi-experimental;

Table 4 - Outcomes

Article Id	Variables Under Investigation	Outcomes
Class discussion		
5	Writing Quality Patterns of discourse Student Attitude	The quantity and quality of discourse was very high. The instances of code switching were few. The need for teacher intervention to stimulate conversation was low, and student response to communicating on the network was unanimously positive.
Communicative competence		
44	Student Perceptions	The writing revealed a high degree of inventiveness. Students enjoyed the activity and found it helpful to their English language acquisition efforts.
Dialogue journaling		
22	Grammatical accuracy Lexical accuracy Quantity of writing Student Perceptions	Experimental group produced significantly more words ($p=.03$). Lexical and grammatical accuracy not significantly different but exp. Group had fewer lexical errors while control group had fewer grammatical errors The control group showed greater improvement in grammatical accuracy from 1st to last journal entry (not statistically significant). Neither group improved in lexical accuracy. Length of journal entry decreased from 1st to last for both groups. Electronic dialogue journals had a significantly positive effect on the amount of language generated & it improved students' attitude toward learning & practicing the target language, but had no significant advantage over paper-&-pencil with regard to lexical & grammatical accuracy.
62	Language functions used Student attitude Instructor's perceptions	A variety of factors combined to exert an influence on the participants' attitudes towards e-mail. Limited knowledge of e-mail systems prevented some students from taking full advantage of e-mail as a unique communication tool. E-mail created a different writing style to that of paper and pencil, e.g. the e-mail group tended to: a) use formula functions like opening and closing greetings (none of the pen-&-paper group used any); b) use more requesting functions; and c) produce more language functions per writing session. E-mail communication was more spontaneous than paper dialogue.
Essay writing		
3	Writing Quality Student attitude	Experimental group made greater gains in writing achievement - effect size 0.55. Online learning enhanced self-esteem, motivation and sense of achievement and encouraged writing and exchange of ideas

Article Id	Variables Under Investigation	Outcomes
6	Text length Cohesive features	Number of words was significantly higher for word-processed texts (234) than for emails (202.28). Contrary to expectations students use the 10 cohesive features studied with comparable frequency in both types of writing. There were differences in the use of certain cohesive features between Arab and Asian students.
7	Writing Quality Cohesive features Text length	No obvious differences between email and WP but email was significantly shorter; text-initial contextualization was more prominent in WP.
11	Writing quality Peer review Improvement in writing quality	Although first drafts in LAN classes were qualitatively higher than in traditional classes, final drafts in traditional classes were of a higher quality. Further, drafts in traditional classes improved more.
13	Writing performance Text Length Type of revision	Significant growth in writing performance across both groups. Peer tutoring students wrote significantly more words, sentences, and paragraphs and made significantly more content-level revisions. Questionnaire showed that peer tutoring was rated significantly higher than text analysis
23	Writing performance Student Attitude Thinking styles	No difference in the discussion content, amount of communication, or interaction dynamics between the discussions of different configurations, or between the students with internal and external thinking styles. No difference in writing performance between collaborative and independent essays, but ESL raters evaluated collaborative essays higher than independent ones
27	Modes of feedback Student Perceptions	Students did not use computer feedback successfully. The students' backgrounds, their perception of writing, their writing and revision processes and their motivation affected their use of grammar feedback as well as computer feedback. Although they did not make a lot of changes, error feedback drew their attention to their errors and made them more aware of these errors.
29	Type of revision	Microstructure changes accounted for the highest variation and had the strongest relation to all revision changes. Meaning preserving changes accounted for the lowest variation and had the weakest relation to all revision changes. Importance of text for the students was found to be the most important and significant predictor variable for the number of changes performed.
33	Writing quality Pre-writing time Student Perceptions Composing processes	Individual participants are engaged in different ways and to differing degrees by the writing prompts and by the test-taking modality. Essays produced in the paper mode were rated slightly higher in quality than essays produced in the computer mode.

Article Id	Variables Under Investigation	Outcomes
34	Interaction Communicative competence Student Motivation Student Attitude	Student-teacher interaction greater in computer group, resulting in more drafts of writing than from the control group. Computer group exhibited a better awareness of audience in their writing. Computer students more motivated as evidenced by their early arrival and late departure for most lessons.
35	Writing quality Frequency of revision Thinking process Type of revision	Continuous exposure to WP-assisted writing, combined with proper training, can help L2 learners to improve their writing skills and writing quality. Advantages for WP medium over the pen-and-paper medium are: a greater frequency of revisions made at the discourse and syntactical level; higher scores for content of the completed compositions; and more extensive evaluation of written texts in think-aloud verbal reports.
36	Grammatical accuracy Lexical complexity Syntactic complexity Rhetorical strategies	Significant syntactic, lexical and grammatical differences found in the students' e-mail writing of the different tasks. In tasks involving audience interaction, students tended to produce syntactically and lexically more complex texts, and in tasks which allowed students self-selection of topics and content, students also tended to use more complex sentences and richer and more diverse vocabulary. An interesting trade-off effect was observed between linguistic complexity and grammatical accuracy.
40	Citation strategies Writing performance Student Attitude	Reading ability correlates to writing ability Writing ability not correlated to amount of time searching the web for sources. Citation types - Quotation (43%); paraphrase (32%); Summary (25%). Relevance of citations - Essential (40%); Relevant (51%); Irrelevant (9%)
42	Peer review Effectiveness of revision	The overall number of comments, the percentage of revision-oriented comments, and consequently the overall number of revisions made by the experimental group were larger than those by the traditional group. The experimental group tended to find MOO interaction affectively more appealing, but face-to-face communication seems more effective than MOO communication because of the nonverbal communication feature that is indispensable in intercultural communication in a peer review setting.
43	Modes of feedback Writing quality	The students' choices of feedback method varied as a function of the level of their computer anxiety and providing the choice of using or not using computers helped both high- and low-anxiety students improve their essay writing.
47	Writing quality Discussion quality Participation	Students' participation increased and their essay-writing quality improved. Students moved from a knowledge-telling to a knowledge-building approach in their essays, as revealed by a significant increase in the rating scores on students' knowledge attribute from the essays at stage 1.

Article Id	Variables Under Investigation	Outcomes
50	Type of revision	Experience with the computer was a stronger factor than writing proficiency in determining computer writing strategies. The two inexperienced computer users spent less time revising, made more surface changes, and used the computer functions less than the experienced computer users. Experienced users also showed a greater concern for content than did inexperienced users, who indicated apprehension about using the computer and concern for correctness.
56	Citing Web sources Student Perceptions	The participants appeared to have an awareness of the differing quality of research sources, including those on the WWW. However, the extent to which they displayed the WWW's limitations as a research source was only partially evident. Finally, various issues and nuances arising out of this study suggest that the nature of the WWW as a research source, although similar to conventional sources in many fundamental ways, has differences significant enough to require new initiatives in the EAP writing curriculum.
General writing		
1	Participant roles	CMC was more able than group journals to elicit a larger variety of participant roles which were collaboratively negotiated.
8	Rhetorical strategies Task relevance	Students able to use a wide variety of rhetorical strategies to interact with their instructor. They also exhibited a good ability to switch between formal and informal language.
9	Student Perceptions	Overall CommonSpace received weak ratings on wordprocessing, file transfer and spell-checking. Rated very highly on receiving comments.
10	Writing performance Task relevance Motivational strategy integration Student Attitude	Students who worked with the full strategy integration version of the courseware significantly outperformed students who worked with the basic and medium integration modalities Motivational strategy integration did not have a significant effect on attitudes, which were quite positive towards the writing practice with the courseware.
12	Writing quality Peer review Improvement in writing quality	The networked setting promoted better writing and more peer and teacher feedback. The traditional setting promoted more improvement in writing. This was attributed to first drafts in the networked classes being closer to students' maximal performance. Students using network gave lengthier feedback (480 words v 197). Teacher also gave lengthier feedback and spent less time per student for the network group.
14	Writing quality Writing efficiency	Learners benefited from computer writing. Most evident among mid-skilled learners - positive effects may depend on level of linguistic skill.

Article Id	Variables Under Investigation	Outcomes
15	Writing performance Writing apprehension Student Perceptions	WWI improved students' writing performance significantly more than traditional writing instruction. The WWI class had a significant reduction in writing apprehension; but no significant difference in reduced apprehension was found between the two groups. Students had a favorable perception of the WWI, but there was no significant between students' perception and their improved writing performance or their reduced writing apprehension.
16	Peer review Student Perceptions	Several advantages to OLPR - students remained more focused; teacher can monitor students' interaction more closely; students need not depend on memory to revise their drafts
17	Cross-cultural understanding Student Perceptions Student Motivation	Positive. Students were keen to write to their key-pals, and delighted with the emails they received from them. They found it rewarding to make discoveries about a culture with which they had been almost completely unfamiliar.
18	Structural adequacy Technical adequacy Student Motivation	The experimental students achieved significantly higher ratings for the logical linking of ideas in the body of their essays & were positive about the technology.
19	Grammatical accuracy Student perceptions	Learners are willing to use concordances to work on grammar, they are able to make corrections based on concordances, and precast links are a useful training system that leads some learners to independent concordancing.
20	Text Length Writing quality	The results of the experimental class equaled, and in some instances surpassed, those of the traditional class. The experimental class wrote more and their percentage of errors dropped more than that of the traditional class. Although the holistic scores rated the traditional class an average 0.6 points (out of a max. of six) higher grade, this difference is attributed to the considerable amount of time devoted to teaching grammar and correcting errors in the traditional class.
21	Language functions used	The study identified some of the features that distinguish the language produced via e-mail from that produced in traditional in-class paper-and-pencil assignments. These are: a greater amount of language; more variety of topics and language functions; e.g., a greater number of questions and use of discourse management markers; a higher level of language accuracy (at least at the beginning level); more similarity with oral language; more student-initiated interactions; and more personal and expressive language use.
24	Writing achievement Text length Effectiveness of revision Student Attitude	The word processing/bilingual group had significantly higher posttest reading achievement and attitudes to writing It also had higher posttest writing achievement (but not significant). The word processing group produced longer texts and had fewer errors in both first and final drafts. The group which did not do word processing produced more texts and made more mature revisions. Neither group did significantly better at editing their errors.

Article Id	Variables Under Investigation	Outcomes
25	Writing quality Writing process Time on task	The general findings were: a) Time was not a significant factor in determining student's writing quality. b) ESL students did not spend a lot of time on prewriting activities such as brainstorming and outlining. c) On-line "Guided" prewriting activity had a positive relationship with the quality of student's writing. d) The WWS environment encouraged students to write multiple drafts. e) Recursiveness in writing was a significant factor in determining writing quality. f) Revising earlier paragraphs only when the whole essay was "finished" seemed to be a significant factor in determining essay quality. g) Students did pay attention to on-line teacher's comments on their essays. h) Linguistic competence was not a predictive factor of student's writing quality. i) Monitoring of what constitutes an essay had a negative relationship to the quality of essays.
26	Pre-writing discussion Student Perceptions	Results indicate that students did use some of the ideas discussed during computer-mediated prewriting discussions, but not very often. Almost half of the ideas used were concerned with macro-level composition issues suggesting that the quality of the comments was good.
28	Student Attitude Interaction Keyboarding skills	Students were more at ease with the word processing approach to writing than they had been with the structured pen and paper approach they had previously been exposed to. The less structured teaching/learning writing environment led to peer collaboration which consisted of discussions about operating the technology and appropriate ways to write in English. Developing proficiency with the word processing system enabled students the freedom to explore writing as a process. The students did not, however, seem to reach the final stage of the writing process - editing.
30	Writing quality Text length Student Perceptions	The quantitative analysis of the essays corroborated the students' assertions that the computer was beneficial for them as a writing tool. Seven students achieved gains in their holistic scores for both posttests, and seven achieved gains in essay length on the handwritten posttest. All eight wrote considerably longer essays when using the computer. All eight wrote that they enjoyed writing more when using a computer to compose than when they did not.
31	Revision strategies	Most ESL students in the study realized that revision involved making changes in both content and mechanics. Generally, students were more reliant on the teacher for revision directions if they were given explicit comments. Most of the writers did not revise differently in response to a change in discourse type. However, they revised strategically in every stage of writing. The computer enabled the writers to make more changes during writing the first drafts and revise more recursively when revising the second drafts.
32	Writing quality	All aspects of composition except Content scored significantly higher for the computer group.
37	Syntacticization	Negotiations provided an environment for increasing & maintaining syntax learning, however, not uniformly in all areas (e.g., tense /aspect), nor any more so than other types of social interaction.

Article Id	Variables Under Investigation	Outcomes
38	Writing quality Student Attitude Vocabulary development	The experimental group improved their reading comprehension and writing and they held positive attitudes toward the Web activity.
39	Grammatical accuracy Writing performance Student Perceptions	Each of the two packages (Grammatik and Complete Writer's Toolkit), has a role to play for students of various proficiency levels and weak subjects benefited more from Writer's Toolkit and liked such programs better. No difference in writing quality was found between students who used the programs and those that did not. Attitudes toward the use of such programs tended to be positive.
41	Writing quality Student Attitude Student Perceptions	Did not show CALL to be superior to paper/pencil homework, but also did not find evidence to indicate that CALL is detrimental.
45	Revision strategies	Tentatively confirms that revision in computer-aided FL writing at the advanced intermediate level consists primarily of changes for form rather than for content.
46	Writing performance Student Attitude	The computer-based writing group scored higher on the writing sample primary trait score, while the traditional group scored higher on the other measures of content and organization, expression, and grammar. Analysis of covariance showed no significant difference between the performance of the two groups. However, students assigned to the three English teachers (two traditional and one computer program teacher) outperformed the students assigned to the computer teacher with no previous experience teaching writing. Pre and post scores on the attitude survey indicated a significant positive change in attitude toward writing for all groups.
48	Type of revision Text length Student Attitude	Students using text-critiquing program wrote shorter compositions, became less independent in their editing, and made fewer revisions affecting meaning than did the subjects in the comparison group. No clear result emerged as to the thoroughness of editing.
49	Writing apprehension Student Attitude	The L2 writers benefited from using computers to write more than L1 writers, at least in their attitudes. Computer use for this population did not reduce overall apprehension.
51	Proofreading skill	Subjects' recognition of error was significantly improved by having the text presented in typographical conditions which encouraged concentration on fewer distractors for error detection.
52	Writing process	Students did little planning and frequently changed from one process level to another. Formulation was done at clause, phrase or word level if possible, or switched into the L1 until the formulation had been agreed. Students did not always use the correct form suggested by the spell checker, and if a correct solution was not offered, they rarely tried other ways to solve the problem.

Article Id	Variables Under Investigation	Outcomes
53	Writing strategies	Most difficulties were solved intuitively and at least 2/3 were worked out successfully. Students tend to find acceptable solutions to that they are aware of.
54	Writing process	As students became familiar with Système-D, they were more careful to follow the prescribed tasks by accessing the recommended information screens; were more likely to check for detailed information on correct usage; engaged in a more systematic revision; began to rely on their intuition and look up words in the L2. General dictionary use declined significantly for all students
55	Writing quality Self-esteem	There was a statistically significant difference in the quality of writing between the word processing group and the traditional pen and paper group. The expectation of improved self-esteem was not supported.
57	Student Perceptions	Students felt that CALL stimulated interest, allowed for easy and convenient gathering of information, and provided exposure to various types of English texts. Disadvantages cited were: problems with pair work; desire for more assistance from the teacher; difficulty with having to give peer feedback.
58	Student Perceptions Student-computer interaction	All writers found it useful to view their writing strategies displayed in Trace-it, where they were made aware of their individual writing behaviours. The use of Trace-it in the L2 writing classroom promoted successful self-assessment and reflection upon an individual's own work without restricting their individuality.
59	Writing quality Student attitude Student anxiety	The writing environment had no effect on attitudes toward writing with computers or writing apprehension. Writing quality improved in the computer-assisted classroom (significant at the 0.08). Types/patterns of discourse in the two environments were clearly different. In large group discussions, the teacher's role was minimized in the computer-assisted classroom, while the opposite was found in the oral classroom. In peer response group sessions, comments made were more focused in the computer-assisted classroom but more numerous in the oral classroom.
61	Writing strategies	The study uncovered different, contrasting writing behaviours and a diversity of texts. It found that L2 writers seem to keep an audience in mind as well as a purpose for their writing, and their discourse varies accordingly. Learners experimented with linguistic forms, integrated the use of various information sources, and tried to communicate.
63	Student attitude Student motivation	Overall positive attitude. Self-reported knowledge of computers and amount of experience with email correlated positively with motivation. Degree to which computer-based projects were integrated into overall goals & structure of course important for motivation.
Note-taking and Report-writing		

Article Id	Variables Under Investigation	Outcomes
2	Writing Quality	Significant improvement in 1st pilot. Finding ambiguous for the 2nd pilot.
Technical writing		
60	Writing quality Writing apprehension Student attitude Revision strategies	Students with more positive attitudes toward writing and the usefulness of computers tended to produce better quality writing. Students who revised their writing more frequently tended to have better attitudes toward writing than those who did not. In contrast, students' levels of computer anxiety, computer confidence, computer liking and their writing revision practices did not significantly affect the quality of their writing. The amount of time that students spent on computers did not significantly affect their attitudes toward using computers in writing.

Appendix B

Research Design Terminology

PRE-EXPERIMENTAL DESIGN

May have pre- and posttreatment tests, but lacks a control group. (Nunan, 1992:41)

QUASI-EXPERIMENTAL DESIGN

Has both pre and posttests and experimental and control groups, but no random assignment of subjects.(Nunan, 1992:41)

EXPERIMENTAL DESIGN

Has both pre and posttests, experimental and control groups, and random assignment of subjects.(Nunan, 1992:41)

NONEXPERIMENTAL DESIGN

Refers to situations in which a presumed cause and effect are identified and measured but in which other structural features of experiments, such as random assignment, pretests and control groups are missing. Instead reliance is placed on measuring alternative explanations individually and then statistically controlling for them.

ONE-GROUP PRETEST-POSTTEST DESIGN

A single pre-test observation is taken on a group of respondents, treatment then occurs, and a single posttest observation on the same measure follows (Shadish et al., 2002:108)

NONEQUIVALENT COMPARISON GROUP DESIGN

Uses a treatment group and an untreated comparison group, with both pretest and posttest data gathered on the same units. (Shadish et al., 2002:136)

POSTTEST-ONLY CONTROL GROUP DESIGN

Incorporates just the basic elements of experimental design: random assignment of subjects to treatment and control groups, introduction of the independent variable to the treatment group, and a post treatment measure of the dependent variable for both groups. (Singleton Jr. et al., 1993:222)

PRETEST-POSTTEST CONTROL GROUP DESIGN

A design which measures the experimental group before and after the experimental treatment. A control group is measured at the same time, but does not receive the experimental treatment.

WITHIN-SUBJECTS

A study designed to make a comparison of 2 or more treatments and that compares them by having each user try each treatment, measuring their performance for each. (Diamond Bullet)

BETWEEN-SUBJECTS

A study designed to make a comparison of 2 or more treatments and that compares them by having one set of users try one treatment and another set of users try another treatment, measuring their performance for each. (Diamond Bullet)

FACTORIAL EXPERIMENTAL DESIGN

A design which enables the effects of two or more independent variables to be explored jointly. (Singleton Jr. et al., 1993:225)

CASE STUDY

A strategy for doing research which involves an empirical investigation of a particular contemporary phenomenon within its real life context using multiple sources of evidence. (Robson, 2002:178)

CROSS-SECTIONAL SURVEY

Data on a sample or “cross section” of respondents chosen to represent a particular target population are gathered at essentially one point in time. (Singleton Jr. et al., 1993:254)

NONPARTICIPANT OBSERVATION

An approach to field research in which the researcher attempts to observe people without interacting with them and, typically without their knowing that they are being observed. (Singleton Jr. et al., 1993:520)

TIME SERIES

Refers to a large series of observations made on the same variable consecutively over time. The observations can be on the same unit or on different but similar units. (Shadish et al., 2002:172)

PYRAMID STRUCTURED DESIGN

In such a design various layers of information are collected. At the base the data are of a more general type collected from a large number of informants. When moving upwards more and more detailed information is collected about an increasingly limited selection of the informants. The result is a collection of data imparting to the research a degree of breadth as well as depth in the sense that the various layers can supplement and elucidate one another. (Poulsen, 1991: 78)

EX POST FACTO DESIGNS

In such designs you will look at the type of connection between independent and dependent variables or the strength of the connection without considering what went before. No treatment is involved. Good design requires, however, that you consider all the possible threats to the

validity of the study and try to control for as many of them as possible..... This is the most common design type in applied linguistics for it allows us to discover "what is going on" rather than "what caused this." (Hatch & Lazaraton, 1991: 99-100)

DESIGN EXPERIMENT

An approach to research which tries out interventions, tests to see if they work, and makes improvements. It is a kind of research paradigm in which one cycle of research follows on the findings of the previous cycle of innovative design. (Peng, 2004: 40)

EFFECT SIZE

The number of standard deviation units separating scores of experimental and control groups. Values above 0.25 are large enough to be educationally meaningful (Kulik 2003).

HAWTHORNE EFFECT

Refers to participants' awareness of being studied affecting their performance (Singleton Jr., Straits & Straits 1993:29).

PYGMALION EFFECT

Refers to teachers' expectations about student achievement becoming self-fulfilling prophecies (Shadish, Cook & Campbell 2002:78).

Appendix C

Research Studies

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Table 1: Studies by Research Design*

Research Design	Pre-Experimental	Quasi-experimental	Experimental	Non-experimental
One-group Pre-Post Tests	2	19		30
Nonequivalent Comparison Group Design				
Posttest-only Control Group		15, 22, 34	32	
Pretest-Posttest Control Group		3, 11, 12, 13, 24, 39, 55, 59	18, 38, 41	
Within-subjects Design	16	1, 6, 23, 33	14	
Between-subjects Design		42, 48	37, 53	
Factorial Experimental Design			10, 27	
Design Experiment			47	
Analysis of transcripts				5, 8, 26, 29, 36, 40, 44
Analysis of writing		46		7, 20, 21, 25, 43, 60
Case Study				28, 31, 35, 45, 50, 58, 61, 62
Examination of computer logs				54
Pyramid-structured Design				52, 53
Questionnaires				9, 17, 49, 56
Survey/questionnaires				63
Written reflections				57
Total	2	19	10	31

*see definitions in Appendix B

Note: Numbers represent the studies' ID.

Table 2: Studies by Language and Writing Task Taught

Writing Task	EFL	ESL	ESL/EFL	French	German	Japanese	Spanish	Total
Academic Writing	11, 34, 56	7, 27, 36	63					7
Class Discussion				5				1
Communicative competence		44						1
Composition	26, 40	8, 9, 12, 16 23, 30, 32, 44, 48, 49, 50, 55, 59		45, 54				17
Dialogue journaling		62					22	2
Essay writing	6, 29, 43, 47	3, 13, 33, 35						8
Grammar & Writing	39, 41							2
Note-taking		2						1
Reading/Writing/Vocab	38							1
Technical writing	60							1
General Writing	15, 17, 19, 51, 52, 53, 58	20, 24, 25, 28, 31, 37, 46, 57			1, 18	14	10, 21, 61	21
Total	20	31	1	3	2	1	4	62

Table 3: Studies by Research Type and Variable under investigation

Task under investigation	Pre-exp.	Quasi-experimental	Experimental	Non-experimental	Total
Academic Writing		11, 34	27	7, 36, 56, 63	7
Class Discussion				5	1
Communicative competence				44	1
Composition	16	12, 23, 42, 48, 55, 59	32	8, 9, 26, 30, 40, 45, 49, 50, 54	17
Dialogue journaling		22		62	2
Essay writing		3, 6, 13, 33	47	29, 35, 43	8
Grammar & Writing		39	41		2
Note-taking	2				1
Reading/Writing/Vocab			38		1
Technical writing				60	1
General Writing		1, 15, 19, 24, 46	10, 14, 18, 37, 51,	17, 20, 21, 25, 28, 31, 52, 53, 57, 58, 61	21
Total	2	19	10	31	63

Table 4 - Outcomes

Article Id	Variables Under Investigation	Outcomes
Class discussion		
5	Writing Quality Patterns of discourse Student Attitude	The quantity and quality of discourse was very high. The instances of code switching were few. The need for teacher intervention to stimulate conversation was low, and student response to communicating on the network was unanimously positive.
Communicative competence		
44	Student Perceptions	The writing revealed a high degree of inventiveness. Students enjoyed the activity and found it helpful to their English language acquisition efforts.
Dialogue journaling		
22	Grammatical accuracy Lexical accuracy Quantity of writing Student Perceptions	Experimental group produced significantly more words ($p=.03$). Lexical and grammatical accuracy not significantly different but exp. Group had fewer lexical errors while control group had fewer grammatical errors The control group showed greater improvement in grammatical accuracy from 1st to last journal entry (not statistically significant). Neither group improved in lexical accuracy. Length of journal entry decreased from 1st to last for both groups. Electronic dialogue journals had a significantly positive effect on the amount of language generated & it improved students' attitude toward learning & practicing the target language, but had no significant advantage over paper-&-pencil with regard to lexical & grammatical accuracy.
62	Language functions used Student attitude Instructor's perceptions	A variety of factors combined to exert an influence on the participants' attitudes towards e-mail. Limited knowledge of e-mail systems prevented some students from taking full advantage of e-mail as a unique communication tool. E-mail created a different writing style to that of paper and pencil, e.g. the e-mail group tended to: a) use formula functions like opening and closing greetings (none of the pen-&-paper group used any); b) use more requesting functions; and c) produce more language functions per writing session. E-mail communication was more spontaneous than paper dialogue.
Essay writing		
3	Writing Quality Student attitude	Experimental group made greater gains in writing achievement - effect size 0.55. Online learning enhanced self-esteem, motivation and sense of achievement and encouraged writing and exchange of ideas

Article Id	Variables Under Investigation	Outcomes
6	Text length Cohesive features	Number of words was significantly higher for word-processed texts (234) than for emails (202.28). Contrary to expectations students use the 10 cohesive features studied with comparable frequency in both types of writing. There were differences in the use of certain cohesive features between Arab and Asian students.
7	Writing Quality Cohesive features Text length	No obvious differences between email and WP but email was significantly shorter; text-initial contextualization was more prominent in WP.
11	Writing quality Peer review Improvement in writing quality	Although first drafts in LAN classes were qualitatively higher than in traditional classes, final drafts in traditional classes were of a higher quality. Further, drafts in traditional classes improved more.
13	Writing performance Text Length Type of revision	Significant growth in writing performance across both groups. Peer tutoring students wrote significantly more words, sentences, and paragraphs and made significantly more content-level revisions. Questionnaire showed that peer tutoring was rated significantly higher than text analysis
23	Writing performance Student Attitude Thinking styles	No difference in the discussion content, amount of communication, or interaction dynamics between the discussions of different configurations, or between the students with internal and external thinking styles. No difference in writing performance between collaborative and independent essays, but ESL raters evaluated collaborative essays higher than independent ones
27	Modes of feedback Student Perceptions	Students did not use computer feedback successfully. The students' backgrounds, their perception of writing, their writing and revision processes and their motivation affected their use of grammar feedback as well as computer feedback. Although they did not make a lot of changes, error feedback drew their attention to their errors and made them more aware of these errors.
29	Type of revision	Microstructure changes accounted for the highest variation and had the strongest relation to all revision changes. Meaning preserving changes accounted for the lowest variation and had the weakest relation to all revision changes. Importance of text for the students was found to be the most important and significant predictor variable for the number of changes performed.
33	Writing quality Pre-writing time Student Perceptions Composing processes	Individual participants are engaged in different ways and to differing degrees by the writing prompts and by the test-taking modality. Essays produced in the paper mode were rated slightly higher in quality than essays produced in the computer mode.

Article Id	Variables Under Investigation	Outcomes
34	Interaction Communicative competence Student Motivation Student Attitude	Student-teacher interaction greater in computer group, resulting in more drafts of writing than from the control group. Computer group exhibited a better awareness of audience in their writing. Computer students more motivated as evidenced by their early arrival and late departure for most lessons.
35	Writing quality Frequency of revision Thinking process Type of revision	Continuous exposure to WP-assisted writing, combined with proper training, can help L2 learners to improve their writing skills and writing quality. Advantages for WP medium over the pen-and-paper medium are: a greater frequency of revisions made at the discourse and syntactical level; higher scores for content of the completed compositions; and more extensive evaluation of written texts in think-aloud verbal reports.
36	Grammatical accuracy Lexical complexity Syntactic complexity Rhetorical strategies	Significant syntactic, lexical and grammatical differences found in the students' e-mail writing of the different tasks. In tasks involving audience interaction, students tended to produce syntactically and lexically more complex texts, and in tasks which allowed students self-selection of topics and content, students also tended to use more complex sentences and richer and more diverse vocabulary. An interesting trade-off effect was observed between linguistic complexity and grammatical accuracy.
40	Citation strategies Writing performance Student Attitude	Reading ability correlates to writing ability Writing ability not correlated to amount of time searching the web for sources. Citation types - Quotation (43%); paraphrase (32%); Summary (25%). Relevance of citations - Essential (40%); Relevant (51%); Irrelevant (9%)
42	Peer review Effectiveness of revision	The overall number of comments, the percentage of revision-oriented comments, and consequently the overall number of revisions made by the experimental group were larger than those by the traditional group. The experimental group tended to find MOO interaction affectively more appealing, but face-to-face communication seems more effective than MOO communication because of the nonverbal communication feature that is indispensable in intercultural communication in a peer review setting.
43	Modes of feedback Writing quality	The students' choices of feedback method varied as a function of the level of their computer anxiety and providing the choice of using or not using computers helped both high- and low-anxiety students improve their essay writing.
47	Writing quality Discussion quality Participation	Students' participation increased and their essay-writing quality improved. Students moved from a knowledge-telling to a knowledge-building approach in their essays, as revealed by a significant increase in the rating scores on students' knowledge attribute from the essays at stage 1.

Article Id	Variables Under Investigation	Outcomes
50	Type of revision	Experience with the computer was a stronger factor than writing proficiency in determining computer writing strategies. The two inexperienced computer users spent less time revising, made more surface changes, and used the computer functions less than the experienced computer users. Experienced users also showed a greater concern for content than did inexperienced users, who indicated apprehension about using the computer and concern for correctness.
56	Citing Web sources Student Perceptions	The participants appeared to have an awareness of the differing quality of research sources, including those on the WWW. However, the extent to which they displayed the WWW's limitations as a research source was only partially evident. Finally, various issues and nuances arising out of this study suggest that the nature of the WWW as a research source, although similar to conventional sources in many fundamental ways, has differences significant enough to require new initiatives in the EAP writing curriculum.
General writing		
1	Participant roles	CMC was more able than group journals to elicit a larger variety of participant roles which were collaboratively negotiated.
8	Rhetorical strategies Task relevance	Students able to use a wide variety of rhetorical strategies to interact with their instructor. They also exhibited a good ability to switch between formal and informal language.
9	Student Perceptions	Overall CommonSpace received weak ratings on wordprocessing, file transfer and spell-checking. Rated very highly on receiving comments.
10	Writing performance Task relevance Motivational strategy integration Student Attitude	Students who worked with the full strategy integration version of the courseware significantly outperformed students who worked with the basic and medium integration modalities Motivational strategy integration did not have a significant effect on attitudes, which were quite positive towards the writing practice with the courseware.
12	Writing quality Peer review Improvement in writing quality	The networked setting promoted better writing and more peer and teacher feedback. The traditional setting promoted more improvement in writing. This was attributed to first drafts in the networked classes being closer to students' maximal performance. Students using network gave lengthier feedback (480 words v 197). Teacher also gave lengthier feedback and spent less time per student for the network group.
14	Writing quality Writing efficiency	Learners benefited from computer writing. Most evident among mid-skilled learners - positive effects may depend on level of linguistic skill.

Article Id	Variables Under Investigation	Outcomes
15	Writing performance Writing apprehension Student Perceptions	WWI improved students' writing performance significantly more than traditional writing instruction. The WWI class had a significant reduction in writing apprehension; but no significant difference in reduced apprehension was found between the two groups. Students had a favorable perception of the WWI, but there was no significant between students' perception and their improved writing performance or their reduced writing apprehension.
16	Peer review Student Perceptions	Several advantages to OLPR - students remained more focused; teacher can monitor students' interaction more closely; students need not depend on memory to revise their drafts
17	Cross-cultural understanding Student Perceptions Student Motivation	Positive. Students were keen to write to their key-pals, and delighted with the emails they received from them. They found it rewarding to make discoveries about a culture with which they had been almost completely unfamiliar.
18	Structural adequacy Technical adequacy Student Motivation	The experimental students achieved significantly higher ratings for the logical linking of ideas in the body of their essays & were positive about the technology.
19	Grammatical accuracy Student perceptions	Learners are willing to use concordances to work on grammar, they are able to make corrections based on concordances, and precast links are a useful training system that leads some learners to independent concordancing.
20	Text Length Writing quality	The results of the experimental class equaled, and in some instances surpassed, those of the traditional class. The experimental class wrote more and their percentage of errors dropped more than that of the traditional class. Although the holistic scores rated the traditional class an average 0.6 points (out of a max. of six) higher grade, this difference is attributed to the considerable amount of time devoted to teaching grammar and correcting errors in the traditional class.
21	Language functions used	The study identified some of the features that distinguish the language produced via e-mail from that produced in traditional in-class paper-and-pencil assignments. These are: a greater amount of language; more variety of topics and language functions; e.g., a greater number of questions and use of discourse management markers; a higher level of language accuracy (at least at the beginning level); more similarity with oral language; more student-initiated interactions; and more personal and expressive language use.

Article Id	Variables Under Investigation	Outcomes
24	Writing achievement Text length Effectiveness of revision Student Attitude	The word processing/bilingual group had significantly higher posttest reading achievement and attitudes to writing. It also had higher posttest writing achievement (but not significant). The word processing group produced longer texts and had fewer errors in both first and final drafts. The group which did not do word processing produced more texts and made more mature revisions. Neither group did significantly better at editing their errors.
25	Writing quality Writing process Time on task	The general findings were: a) Time was not a significant factor in determining student's writing quality. b) ESL students did not spend a lot of time on prewriting activities such as brainstorming and outlining. c) On-line "Guided" prewriting activity had a positive relationship with the quality of student's writing. d) The WWS environment encouraged students to write multiple drafts. e) Recursiveness in writing was a significant factor in determining writing quality. f) Revising earlier paragraphs only when the whole essay was "finished" seemed to be a significant factor in determining essay quality. g) Students did pay attention to on-line teacher's comments on their essays. h) Linguistic competence was not a predictive factor of student's writing quality. i) Monitoring of what constitutes an essay had a negative relationship to the quality of essays.
26	Pre-writing discussion Student Perceptions	Results indicate that students did use some of the ideas discussed during computer-mediated prewriting discussions, but not very often. Almost half of the ideas used were concerned with macro-level composition issues suggesting that the quality of the comments was good.
28	Student Attitude Interaction Keyboarding skills	Students were more at ease with the word processing approach to writing than they had been with the structured pen and paper approach they had previously been exposed to. The less structured teaching/learning writing environment led to peer collaboration which consisted of discussions about operating the technology and appropriate ways to write in English. Developing proficiency with the word processing system enabled students the freedom to explore writing as a process. The students did not, however, seem to reach the final stage of the writing process - editing.
30	Writing quality Text length Student Perceptions	The quantitative analysis of the essays corroborated the students' assertions that the computer was beneficial for them as a writing tool. Seven students achieved gains in their holistic scores for both posttests, and seven achieved gains in essay length on the handwritten posttest. All eight wrote considerably longer essays when using the computer. All eight wrote that they enjoyed writing more when using a computer to compose than when they did not.

Article Id	Variables Under Investigation	Outcomes
31	Revision strategies	Most ESL students in the study realized that revision involved making changes in both content and mechanics. Generally, students were more reliant on the teacher for revision directions if they were given explicit comments. Most of the writers did not revise differently in response to a change in discourse type. However, they revised strategically in every stage of writing. The computer enabled the writers to make more changes during writing the first drafts and revise more recursively when revising the second drafts.
32	Writing quality	All aspects of composition except Content scored significantly higher for the computer group.
37	Syntacticization	Negotiations provided an environment for increasing & maintaining syntax learning, however, not uniformly in all areas (e.g., tense /aspect), nor any more so than other types of social interaction.
38	Writing quality Student Attitude Vocabulary development	The experimental group improved their reading comprehension and writing and they held positive attitudes toward the Web activity.
39	Grammatical accuracy Writing performance Student Perceptions	Each of the two packages (Grammatik and Complete Writer's Toolkit), has a role to play for students of various proficiency levels and weak subjects benefited more from Writer's Toolkit and liked such programs better. No difference in writing quality was found between students who used the programs and those that did not. Attitudes toward the use of such programs tended to be positive.
41	Writing quality Student Attitude Student Perceptions	Did not show CALL to be superior to paper/pencil homework, but also did not find evidence to indicate that CALL is detrimental.
45	Revision strategies	Tentatively confirms that revision in computer-aided FL writing at the advanced intermediate level consists primarily of changes for form rather than for content.
46	Writing performance Student Attitude	The computer-based writing group scored higher on the writing sample primary trait score, while the traditional group scored higher on the other measures of content and organization, expression, and grammar. Analysis of covariance showed no significant difference between the performance of the two groups. However, students assigned to the three English teachers (two traditional and one computer program teacher) outperformed the students assigned to the computer teacher with no previous experience teaching writing. Pre and post scores on the attitude survey indicated a significant positive change in attitude toward writing for all groups.
48	Type of revision Text length Student Attitude	Students using text-critiquing program wrote shorter compositions, became less independent in their editing, and made fewer revisions affecting meaning than did the subjects in the comparison group. No clear result emerged as to the thoroughness of editing.

Article Id	Variables Under Investigation	Outcomes
49	Writing apprehension Student Attitude	The L2 writers benefited from using computers to write more than L1 writers, at least in their attitudes. Computer use for this population did not reduce overall apprehension.
51	Proofreading skill	Subjects' recognition of error was significantly improved by having the text presented in typographical conditions which encouraged concentration on fewer distractors for error detection.
52	Writing process	Students did little planning and frequently changed from one process level to another. Formulation was done at clause, phrase or word level if possible, or switched into the L1 until the formulation had been agreed. Students did not always use the correct form suggested by the spell checker, and if a correct solution was not offered, they rarely tried other ways to solve the problem.
53	Writing strategies	Most difficulties were solved intuitively and at least 2/3 were worked out successfully. Students tend to find acceptable solutions to that they are aware of.
54	Writing process	As students became familiar with Système-D, they were more careful to follow the prescribed tasks by accessing the recommended information screens; were more likely to check for detailed information on correct usage; engaged in a more systematic revision; began to rely on their intuition and look up words in the L2. General dictionary use declined significantly for all students
55	Writing quality Self-esteem	There was a statistically significant difference in the quality of writing between the word processing group and the traditional pen and paper group. The expectation of improved self-esteem was not supported.
57	Student Perceptions	Students felt that CALL stimulated interest, allowed for easy and convenient gathering of information, and provided exposure to various types of English texts. Disadvantages cited were: problems with pair work; desire for more assistance from the teacher; difficulty with having to give peer feedback.
58	Student Perceptions Student-computer interaction	All writers found it useful to view their writing strategies displayed in Trace-it, where they were made aware of their individual writing behaviours. The use of Trace-it in the L2 writing classroom promoted successful self-assessment and reflection upon an individual's own work without restricting their individuality.
59	Writing quality Student attitude Student anxiety	The writing environment had no effect on attitudes toward writing with computers or writing apprehension. Writing quality improved in the computer-assisted classroom (significant at the 0.08). Types/patterns of discourse in the two environments were clearly different. In large group discussions, the teacher's role was minimized in the computer-assisted classroom, while the opposite was found in the oral classroom. In peer response group sessions, comments made were more focused in the computer-assisted classroom but more numerous in the oral classroom.

Article Id	Variables Under Investigation	Outcomes
61	Writing strategies	The study uncovered different, contrasting writing behaviours and a diversity of texts. It found that L2 writers seem to keep an audience in mind as well as a purpose for their writing, and their discourse varies accordingly. Learners experimented with linguistic forms, integrated the use of various information sources, and tried to communicate.
63	Student attitude Student motivation	Overall positive attitude. Self-reported knowledge of computers and amount of experience with email correlated positively with motivation. Degree to which computer-based projects were integrated into overall goals & structure of course important for motivation.
Note-taking and Report-writing		
2	Writing Quality	Significant improvement in 1st pilot. Finding ambiguous for the 2nd pilot.
Technical writing		
60	Writing quality Writing apprehension Student attitude Revision strategies	Students with more positive attitudes toward writing and the usefulness of computers tended to produce better quality writing. Students who revised their writing more frequently tended to have better attitudes toward writing than those who did not. In contrast, students' levels of computer anxiety, computer confidence, computer liking and their writing revision practices did not significantly affect the quality of their writing. The amount of time that students spent on computers did not significantly affect their attitudes toward using computers in writing.