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A Meta-Analysis of Research in
**Computer Assisted
Language Learning
During 1995 - 2000**

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Contents

<i>Preface</i>	<i>ix</i>
1.0 Introduction	1
2.0 Research in CALL	2
3.0 Survey Method	3
4.0 Results of the Survey	5
4.1 Number of Studies	5
4.2 Computer Assisted Writing	5
4.3 Email	14
4.4 Word-Processing	20
4.5 Attitudes Towards Computers	23
4.6 Effects and Effectiveness	26
4.7 Gender Issues	30
4.8 Internet	34
4.9 Perceptions and CALL	38
4.10 Hypertext / Hypermedia	39
4.11 Listening	42
4.12 Grammar	43
4.13 Vocabulary	45
4.14 Computer Mediated Communication	47
4.15 Learning Strategies	53
4.16 Collaborative Learning	54
4.17 Literature	56
4.18 Text Analysis/Concordance	58
4.19 Multimedia	60
4.20 English for Specific Purposes	61
4.21 Computer Anxiety	63
4.22 General Findings	64
5.0 Conclusion	66
<i>Bibliography</i>	<i>67</i>
<i>Index</i>	<i>73</i>



List of Tables

Table 1:	Computer Assisted Writing	6
Table 2:	Email	14
Table 3:	Word Processing	20
Table 4:	Attitudes Towards Computers	23
Table 5:	Effects and Effectiveness	26
Table 6:	Gender Issues	30
Table 7:	Internet	34
Table 8:	Perceptions and CALL	38
Table 9:	Hypertext / Hypermedia	39
Table 10:	Listening	42
Table 11:	Grammar	43
Table 12:	Vocabulary	45
Table 13:	Computer Mediated Communication	47
Table 14:	Learning Strategies	53
Table 15:	Collaborative Learning	54
Table 16:	Literature	56
Table 17:	Text Analysis	58
Table 18:	Multimedia	60
Table 19:	English for Specific Purposes	61
Table 20:	Computer Anxiety	63



Preface

The present monograph contains a summary of research papers on various areas that come under the umbrella *Computer Assisted Language Learning*. The work, however, is limited to those produced from 1995 to 2000. It continues from Basena and Jamieson's (1996) survey which was conducted for the period 1990-1994. The earlier sections in this monograph are those that are heavily researched while those under the later sub-headings of this monograph were hardly explored. *A Meta-Analysis of Research in Computer Assisted Language Learning During 1995-2000* thus illustrates the trend of research works in *Computer Assisted Language Learning* towards the end of the nineteenth century. These studies may give us an indication of the future research and applications in this area.

Finally, I acknowledged the Research Centre of the International Islamic University Malaysia for funding this study.

Nuraihan Mat Daud
Kuala Lumpur
2004

1.0 Introduction

The use of computers in language learning has undergone several stages of educational theoretical cycles. When it was introduced in the 1960s, computer assisted language learning (CALL) emphasized the behaviorist learning model where the computer was treated as a mechanical tutor. A mainframe computer at the University of Illinois at Urbana-Champaign, namely PLATO, was the best known tutorial system at that time. It featured repetitive drills, grammatical explanations and translation tests at various intervals (Ahmad et al, 1995).

The personal computer, which appeared about the same time as the rejection of behaviorist approaches in the late 1970s and early 1980s helped to encourage discovery learning. The emphasis then was on the communicative approach, with the focus more on the use of the forms rather than on the forms themselves. In this approach, it is not only what the students do with the computers but what they do with each other while carrying out the given task is emphasized (Warschauer & Healey, 1998).

Their dissatisfaction with the communicative approach led many of the language practitioners to another approach which is known as the integrative approach (Warschauer and Healey, 1998). In this approach, the technology is integrated into the language learning process and greater emphasis is placed on the use of authentic language. Task-based, content-based and project-based methods are included in this approach. The change in the way teachers perceive the teaching process coincides with the emergence of the multimedia networked computer. The vast information that is available on the internet calls for a change in the teacher's role from a provider of information to a facilitator of learning. The teacher ceases to be the sole provider of information as students can access information from the internet especially if such a service is made available in the classroom. In such a class, students would have to be taught the proper search strategy to enable them to download the right information.

2.0 Research in CALL

Changes in the trends of CALL are reflected in the studies conducted in this area. To see the trends about the end of the last century, this research surveyed fieldwork or classroom-based studies that were done during 1995-2000. The findings of such a study would suggest the general trends in the field during this period.

A survey has already been conducted for the period 1990-1994. Basena and Jamieson (1996) surveyed journal articles and dissertation abstracts that reported empirical findings. They found more than 200 articles on Computer Assisted Language Learning but only 67 met their requirements. Among the findings that they made are:

- a) 66% of the 67 studies investigated computer use in second language instruction at the post-secondary level;
- b) 12% investigated the use of computers at the elementary/primary school level;
- c) 52% of the 67 studies were in the areas of English as a second or foreign language;
- d) Writing was the most commonly investigated language skill (34%);
- e) Reading was investigated by 15% of the studies surveyed;
- f) Of the 67 studies, 26 (39%) were dissertation studies;
- g) About 25% of the studies reviewed investigated patterns of communication. These are divided into those that examined email and other written communication, and those that examined conversation between students;
- h) The question of whether conversation and/or performance in the target language increased by pairs of students interacting with a computer was explored in 11 studies;
- i) The individual learner's pronunciation was examined in 4 of the studies;
- j) Studies that investigated grammar tried either to improve students' use of various structures or to determine the functionality of grammar checkers;
- k) 25% of the studies looked at attitudes and interest of students and their teachers;

- 1) Over half of the research studies were either descriptive or qualitative. The statistical procedures used were limited to frequency counts, percentages, means, and standard deviations. Other types of statistical analysis were rare.

Unlike the above study, the present research concentrates on fieldwork or classroom-based studies published in journals only. The search was near exhaustive for a few articles that had to be ordered through inter-library loans had to be excluded from the study. The difficulties in getting materials were also the reason for not including dissertation abstracts. This survey also differs from that of Basena and Jamieson's (1996) in that the focus is on the details of the findings according to the various categories based on articles written on the topic. Categorization is done based on the collection of papers that are written on a particular topic.

3.0 Survey Method

A survey of articles on CALL was carried out based on the following criteria:

- I. Only well-known referred journals are included, and they are in hard-copy form. The journals surveyed are:
 1. AJET (Australian Journal of Educational Technology)
 2. British Educational Communication
 3. British Journal of Educational Technology
 4. British Educational Research Journal
 5. CALICO Journal
 6. CAELL Journal
 7. Computer Assisted Language Learning International Journal
 8. Computers and Education
 9. Computer Languages
 10. Curriculum Inquiry
 11. Educational & Training Technology International (ETTI)
 12. Educational Media International
 13. English Language Teaching (ELT) Journal
 14. English for Specific Purposes (ESP)

15. European Journal of Teacher Education
 16. Innovations in Education and Training (IETI)
 17. Journal of Educational and Behavioral Statistics
 18. Journal of Educational Computing Research
 19. Journal of Educational Measurement
 20. Journal of Computing in Teacher Education
 21. Journal of Teacher Education
 22. Journal of Educational Technology Systems
 23. Journal of Information Technology
 24. Language Arts
 25. Learning and Instruction
 26. Language Learning Journal
 27. Literary and Linguistic Computing
 28. MELTA Journal
 29. MLJ (Modern Language Journal)
 30. New Directions for Teaching and Learning
 31. ON-CALL
 32. Re-CALL
 33. RELC Journal
 34. Research on Language and Social Interaction
 35. Research Strategies
 36. Review of Educational Research
 37. SYSTEM
 38. Teachers College Record
 39. Teacher Education and Practice
 40. Teaching Education
 41. Teaching and Learning
 42. The Computing Teacher
 43. TESOL Journal
 44. TESOL Quarterly
- II. Only articles based on fieldwork or classroom-based research are included. This means that articles based on library research are excluded from the survey.
- III. The selected articles were read and summarized, and the summary of findings are listed under the various sub-headings.

- IV. The survey was conducted between January 1995 and December 2000.
- V. Only items/articles which dealt with the teaching or learning of English as a Second Language were selected.
- VI. Cross-reference technique is used where articles fall under more than one category.

4.0 Results of the Survey

The findings are presented in 22 sub-sections based on the major topics of the study. Wherever possible, the findings are compared to Basena and Jamieson's (1996) to see if there are any changes in the trends of research on CALL. Findings which can come under different sub-headings are cross-listed to ensure that one would not miss any particular findings when reading the sub-section in isolation.

4.1 Number of Studies

In this study, more than 200 journal articles were written on the use of computers in language learning/teaching. Out of these about half were empirical in nature. Although the materials that Basena and Jamieson (1996) studied were different in nature, it is still safe to claim that there is a big improvement in the number of studies on CALL in English as a second or foreign language. There were only 34 in Basena and Jamieson's study, which is about one-fifth of the current study.

4.2 Computer Assisted Writing

Of the four language skills taught, writing was found to be the most commonly investigated language skill, which was also the finding made by Basena and Jamieson (1996). Table 1 shows the predominant use of the email and the internet in this kind of research. The easy accessibility of such facilities especially in the developed countries may be the major factor for their popularity in CALL related research.

Table 1: Computer Assisted Writing

No	Content	Cross-listing	No. of articles
1.	The effects of personal attributes to computer writing quality	Effects, gender	1
2.	The computer vs the pen (Hong Kong study)		1
3.	Computer supported collaborative writing phases	Collaborative Learning, Hypermedia	1
4.	Effects of networking on computer-assisted collaborative writing	Email, Gender, Collaborative Learning	1
5.	Electronic mail exchanges between education graduate students and third-grade children in USA	Email	1
6.	Email exchanges between students of different classes	Email	1
7.	A discourse analysis of comparable word-processed and email writing assignments focusing on 12 cohesive devices.	Email, word-processing	1
8.	A case study of an immigrant teenager who discursively constructed his identity in English with a transborder group of peers on the internet.	Email	1
9.	Computer-based vs conventional teaching of writing	Word processing, attitude	1
10.	ESL writers' ratings of computer based text analysis and peer feedback	Text analysis	1
11.	Computer experience, gender, and classroom environment in computer-supported writing classes	Word-processing, Gender, Perception	1
12.	Using spelling checkers to help novice writers	Word processor, Text analysis	1
13.	Developing and scoring an innovative computerized writing assessment	Word processing	1
14.	Bilingual negotiation via email: An international project	CMC, Email	1
15.	Email tandem learning between non-specialist learners of English in Spain and Spanish learners in England	Email	1
16.	Teaching first-year Spanish On-line	Internet	1
17.	Computers, creativity and communicative competence	Literature	1
18.	Awareness in technology-mediated environments	Email	1
Total			18

Summary of Findings:

- a) More readable reports are written by students with a modest-to-a-high level of word processing and keyboarding experience than did those with little-or-no experience (Barker and Pearce, 1995).
- b) Computer-written reports did not vary by age and gender (Barker and Pearce, 1995).
- c) In a study conducted in Hong Kong, raters evaluated the content, organization, vocabulary, language use and mechanics of students' work. They found that the students in the computer group, on the whole, wrote better than those in the pen group: all aspects of writing except content and organization showed highly significant differences, with the computer group exhibiting superior performance. If the computer group was allowed the first composition as an adjustment period (hence not considered in the evaluation), then they clearly outperformed the pen group in compositions (Lam and Pennington, 1995).
- d) The technology can support collaboration but the group experience did not help to improve the quality of individual writing. The students were quite negative about sharing ideas and working with their peers. To ensure the effectiveness of group writing students would have to be monitored throughout the process (Rada and Wang, 1997-98).
- e) The presence of an authentic audience outside the classroom and the prompt response that they received from them have a positive impact on the students' quality of writing. The study also shows that a cooperative environment and an equal access to the computers attract the females to use the equipment. Results also suggest that the males in the experimental group scored significantly higher than the males in the control group on the writing assignments when they wrote to an outside reader. (Allen and Thompson, 1995).
- f) The children who communicated with adults learned to focus their writing. As the number of correspondence increased, the children employed more complex syntactical structures such as the use of hypothetical structure (i.e. "if...then" clauses), connectives (e.g. because), and a more descriptive language to elaborate the setting for events that they are describing (Britsch and Berkson, 1997).

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- g) In the L2 speakers' exchanges, the improvement of English language skills was not obvious, but the use of email did provide the student with a need to use English to communicate with another L2 speaker (Liaw, 1998).
- h) Two cohesive features, namely demonstrative noun phrases and sentence connectors, differentiated email and word-processed writing. Demonstrative noun phrases occurred more frequently in word-processed texts, while sentence connectors were more salient in email texts. It was also found that, while they usually wrote shorter texts in both media, Arab students tended to use more of some of the cohesive features than other Asian students. The Arab students used notably more demonstrative pronouns and lexical repetition in their email texts than the Asian students did, as well as ellipsis, sentence connectors, clause coordinators and clause subordinators; on the other hand, the Asian students used more demonstrative noun phrases than the Arabs in their email texts. As for word-processed texts, the Arab students used more of all cohesive features – except for demonstrative noun phrases, pronouns and ellipsis – although differences do not appear to be significant. In contrast, Asian students used more demonstrative noun phrases, pronouns and ellipses in their word-processed texts (Biesenbach-Lucas et al., 2000).
- i) The Arab students generally wrote longer word-processed texts than email texts while the difference in length in the Asian students' email and word-processed texts is small (Biesenbach- Lucas et al., 2000).
- j) In a case study on an immigrant using the Internet for communication, it was found that the facility did not really help him to learn the Standard English taught in the classroom. But it helped to connect him to a global English-speaking community and developed a sense of belonging. This is in contrast with the English taught in the classroom which has contributed to his sense of marginalization or exclusion. The Internet has prepared him for the kind of English that is used by the World Wide Web community (Lam, 2000).
- k) Students in the computer-based writing class achieved significantly higher ratings for the logical linking of ideas in the body of essays compared to students in the conventional class. The ability to

reshape work on the screen by cutting and pasting might provide powerful focus on structure, with the clean script printed off at the end of the session a convenient record of what had been achieved in group discussion. When their work was displayed, students did not experience it as threatening but felt distanced emotionally from what they had written and more able to treat their work objectively. Students were also positive about the technology (Felix and Lawson, 1996).

- l) More boys have computers at home and make use of word processing outside school (Levine and Donitsa-Schmidt, 1995).
- m) In the writing class, even a relatively short exposure to computers (about 4 months) can successfully communicate to student with different degrees of prior computer experience the role of computer as a learning tool. But the “word processing experience in a cooperative and collaborative classroom environment may not be enough to change the typical gender-difference pattern reflecting girls’ greater sensitivity to social interaction among students, greater appreciation of clear classroom procedures, and greater appreciation of writing activities in the classroom, than their male peers” (Levine and Donitsa-Schmidt, 1995: 350).
- n) Novice writers used the spelling checker for word-correction, particularly those which are in their receptive but not productive vocabularies. “The spelling checker benefits those students whose initial writing ability is poor and whose writing is blocked by an emphasis on the mechanical aspects of writing” (Gupta, 1998: 255).
- o) A computer-based test of writing was suggested instead of direct writing assessment which was claimed to be time-consuming, and examinees could “write their way around” their shortcomings and thus permit a biased view of their abilities. The test asks examinees to edit a writing passage presented on a computer screen. To do this, the examinee moves a cursor to a suspect section of the passage and chooses from a list of alternative ways of rewriting that section. Any or all parts of the passage can be changed, as often as the examinee likes (Davey et al., 1997).
- p) In the bilingual negotiation between German and English law students, they were allowed to communicate in L1 (50%) and L2

Biodata Pengarang



AB. RAHIM BIN SELAMAT pernah menjadi seorang penuntut tingkatan enam di High School Melaka iaitu selepas lulus peperiksaan pemilihan memasuki tingkatan enam pada tahun 1963. Pada tahun 1964 iaitu setelah empat bulan berada di sekolah tersebut, beliau mengikuti kursus untuk menjadi guru pelatih di Pusat Latihan Daerah. Kaedah guru mengajar dan kaedah pelajar belajar serta pengalamannya yang singkat ketika berada di tingkatan enam sepenuh masa itu akan dikongsi bersama pembaca di dalam buku ini.

Semasa menjadi guru pelatih, beliau terus belajar di tingkatan enam di sekolah yang sama sebagai pelajar sambilan di Kelas Pelajaran Lanjutan atau Further Education Class (1965-1966). Beliau lulus dan berjaya memperoleh sijil Tinggi Pelajaran pada tahun 1967. Kemudian beliau meneruskan pengajiannya di universiti tempatan sehingga memperoleh Ijazah Bachelor dalam bidang Geografi. Beliau meneruskan khidmatnya sebagai guru Geografi tingkatan enam di Sekolah Menengah Tunku Durah, Seremban, Negeri Sembilan pada tahun 1971-1972. Kali pertama mengajar subjek Geografi di sekolah berkenaan, beliau telah berjaya meningkatkan peratus keputusan STP subjek tersebut dari 35% kepada 97%. Paling membanggakan beliau ialah empat orang pelajar aliran Melayu sekolah tersebut berjaya memperoleh prinsipal A, dan ini merupakan satu rekod yang belum pernah dicapai sebelum itu.

Awal tahun 1972 beliau dilantik menjadi Penolong Kanan di Sekolah Menengah Tunku Durah, Seremban iaitu sekolah yang pertama memulakan kelas tingkatan enam sastera aliran Melayu, di Negeri Sembilan. Disebabkan oleh ketiadaan buku teks Geografi dalam bahasa Melayu, maka beliau dan pelajarannya berusaha menterjemah buku teks Geografi bahasa Inggeris. Di samping menjadi penulis buku Geografi Kawasan Malaysia (1975), beliau juga berpengalaman menjadi pemeriksa dan ketua pemeriksa kertas Geografi STP (1971-1978).

Seterusnya ketika menjawat jawatan sebagai Ketua Penolong Pengarah Kurikulum, Jabatan Pelajaran Johor (1982-1985) beliau berjaya membantu menubuhkan kelas tingkatan enam di Sekolah Tun Mamat, Tangkak, Johor pada tahun 1983. Sejak tahun 1990 hingga 2009 beliau telah berjaya mengelolakan seminar tingkatan enam dari aspek pengajaran dan pembelajaran. Latar belakang dan pengalaman beliau itu wajar dikongsi bersama dengan pembaca menerusi buku Pendidikan Tingkatan Enam: Warisan dan Wawasan.



MOHD. SAA'RI BIN MOHD. SANUSI merupakan salah seorang staf pengurusan di Sek. Men. Keb. Ungku Aziz, Sabak Bernam, Selangor. Sebelum menjawat jawatan Penolong kanan Tingkatan Enam, beliau pernah menjadi guru penyelarasan tingkatan enam, di samping mengajar subjek Bahasa Melayu dan Keusasteraan Melayu tingkatan enam (1998-2010), di sekolah berkenaan. Beliau pernah menjadi Jurulatih Utama Negeri bagi subjek Kesusasteraan Melayu STPM (2005-2007), Pengerusi Panitia Kesusasteraan Melayu STPM, Daerah Sabak Bernam (2008-2010).

Beliau mendapat pendidikan asas dan menengah di daerah Sabak Bernam. Seterusnya mengikuti latihan perguruan di MPSI, Tanjong Malim, Perak (1982-1984). Kemudian melanjutkan pengajian di peringkat Ijazah dan Sarjana di UPM, Serdang, Selangor. Kini sedang mengikuti kursus Doktor Pendidikan di Universiti Industri Selangor (Unisel).