Computer Assisted Language Learning for Academic Development Programmes: An Appraisal of Needs, Resources and Approaches.

by

Philip G. Collett

Submitted in part fulfilment of the requirements

for the degree of

MASTER OF EDUCATION

(Computers in Education)

of RHODES UNIVERSITY

December 1993

ABSTRACT

A major objective of Academic Development Programmes is to support the student in acquiring a level of language competence which is sufficient to enable the student to cope with the linguistic demands of academic courses. Language teaching programmes in the Academic Development context in South Africa suffer from a number of constraints: staffing, time on task, relevance, and difficulty of integration with learning in other courses.

A review of developments in the field of Computer Assisted Language Learning (CALL) shows that computers can be used to support language learning. CALL materials range from simple instructional programs to powerful linguistic research tools and need to be integrated into wider language programmes so as to support and enhance other teaching and learning activities. However, relatively little research has been done to investigate the feasibility and effectiveness of CALL in language development courses within Academic Development programmes in South Africa.

The development of a system designed to enable students to practise proof-reading and editing is described and evaluated. Suggestions are made for using this system with other CALL materials within a computer assisted language development environment. It is argued that CALL can be used feasibly and effectively in this environment to enhance learning and to counteract constraints.

ACKNOWLEDGEMENTS

I should like to express my appreciation to the following:

My supervisor, Cecille Marsh for her encouragement and guidance; Sarah Murray, for her enthusiastic support of the project and permission to use material from the English for Academic Purposes Series; Irene Vermaak and Jo Mostert for programming assistance with the help system of the *Write to Improve* software; Kathy Booth for assistance with graphics; the group of teachers and students who assessed and used the system; colleagues at Rhodes and other universities for their interest and suggestions; Rhodes University, the Human Sciences Research Council and the British Council, for research funding which enabled me to do the research on broad trends in Computer Assisted Language Learning.

CONVENTIONS

The word *programme* is used in the general sense of a schedule of activities or events. *Program* is used specifically to refer to computer programs. For stylistic simplicity the masculine form of the personal pronoun is used to refer to a person of unknown gender - no bias is intended. Publishing, copyright and trademark details of software packages are included in the Software Reference List and excluded where these packages are referred to in the text.

IMPORTANT ACRONYMS

AD	-	Academic Development
ADP	-	Academic Development Programme
CAL	-	Computer Assisted Instruction
CALD	-	Computer Assisted Language Development
CALL	-	Computer Assisted Language Learning
CMI	-	Computer Managed Instruction
ELT	-	English Language Teaching
EFL	-	English First Language
ESL	-	English Second Language
ESP	-	English for Specific Purposes

CONTENTS

LIST OF FIGURES AND TABLES

Chapter 1

Introduction

The proliferation of English language development courses in the context of Academic Development Programmes (ADPs) in the past decade reflects the growing realisation that a sufficient level of English language competence cannot be assumed for an increasing number of English second language (ESL) students at tertiary educational institutions in South Africa. Many of these students do not cope with the demands of academic courses because their English language competence is inadequate.

Language development courses have typically been designed to be presented as a series of small-group tutorial exercises, supported by self-study by individual students. So far there has been only limited use of computer assisted methods. It will be argued that it is feasible to develop and implement computer assisted English language programs and materials, and that research is needed into the possible advantages of such materials and their relation to existing courses and methods.

In order to do this it will be necessary to describe the essential objectives and features of existing English language development courses and show to what extent and by what methods computer software could be used to achieve those objectives. This will involve a general assessment of the scope of teaching and tutoring functions which software could perform in this context, as well as practical examples of computer assisted methods.

Since language development courses are often intimately connected with academic development initiatives (referred to hereafter as Academic Development Programmes or ADPs) in institutions, it will be necessary to consider in broad terms the general context, nature and objectives of ADPs, as well as the constraints acting upon these programmes. It will be argued that technology, and more specifically computer-assisted approaches, could significantly alleviate

constraints or enhance learning and that it is therefor important to research the possibilities in this field.

Within this context, the field of enquiry for this study can be described as Computer Assisted Language Development (CALD). Its relationship to general English Language Teaching (ELT), Academic Development (AD) and Computer Assisted Learning (CAL) is proposed in the following figure.

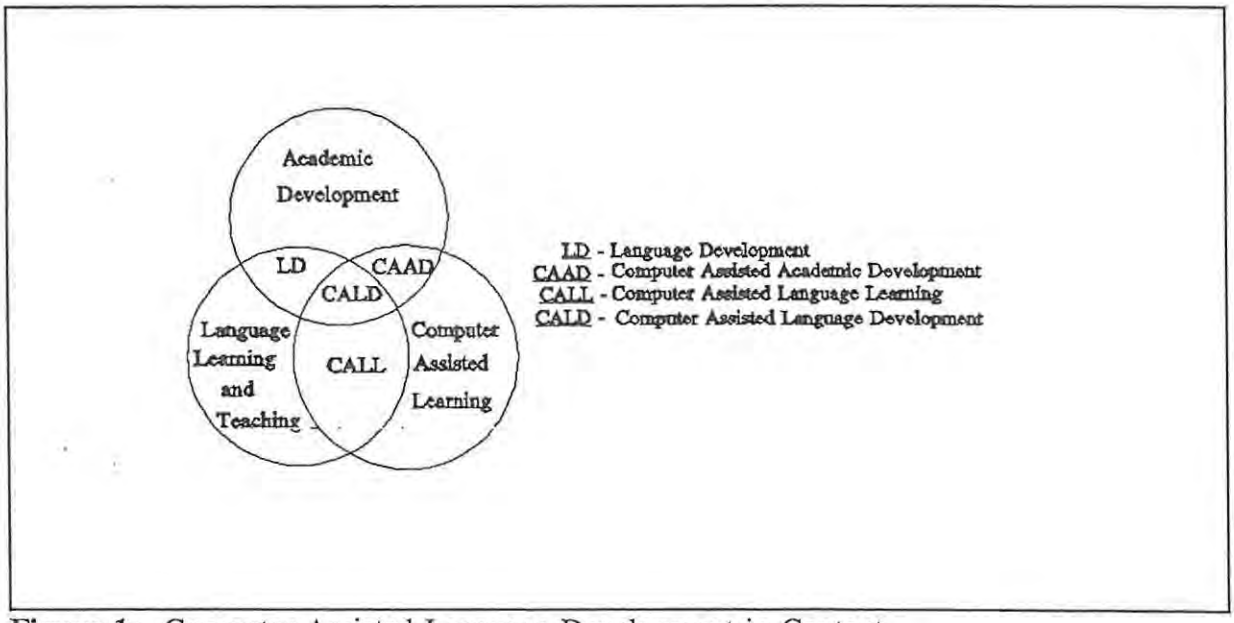


Figure 1: Computer Assisted Language Development in Context

Figure 1 shows CALD at the intersection of three major areas of educational endeavour. All three areas are of considerable relevance to tertiary education in South Africa at present due to increasing numbers of ESL students, decreasing financial resources, rapid advances in technological development, and new paradigms in language teaching. Because of this complex of developments it is argued that the present study is necessarily wide in its focus and ambitious in its attempt to synthesize developments across disciplines.

In Chapter 2 the research method is described and then discussed from a theoretical perspective. The research methodology used is best described by the term Action Research (Cohen and Manion 1989). Broadly speaking, this methodology involves practical innovation and the observation and analysis of the effects of the innovation. It differs from scientific experimentation or naturalistic observation in being collaborative, participatory and self-evaluative. Use is made of triangulation methods to validate observations.

Chapter 3 considers the nature and purpose of Academic Development programmes in South African universities; their clientele, effectiveness and replicability. Language development courses, an important component of AD programmes, are discussed within the framework of research on English language proficiency and general approaches to language teaching. Consideration of other language development courses in AD programmes leads into a more detailed discussion of developments at Rhodes University in this area.

Chapter 4 considers a range of approaches to Computer Assisted Language Learning (CALL): instructional programs, exploratory environments, Intelligent Tutoring Systems, writing tools, word processing and concordancing. CALL projects in South Africa are surveyed.

Chapter 5 is devoted to the researcher's development of a prototype system for setting up editing and proof-reading exercises for students (the *Write To Improve* software) and a description of the system.

The system is evaluated in Chapter 6. An account is given of the researcher's use of the action research methodology to explore the needs and perceptions of language teachers and students. The responses of these groups to the prototype system is analyzed and conclusions are drawn about the development of instructional software.

Chapter 7 considers the usefulness of grammar and style checking programs as a resource for improving student writing. Given satisfactory performance, these programs would be a significant improvement on the structured editing exercises which are possible with the *Write to*

Improve software because the student would be given feedback about his own writing, making the exercise more dynamic, context sensitive and individualised. However, studies which critically assess grammar checking programs conclude that programs of this kind are not yet advanced enough to be useful for teaching purposes. This conclusion is confirmed by the researcher's own studies in this area.

Chapter 8 presents a synthesis of the findings of the study and outlines possible approaches to establishing computer assisted language learning environments in AD programmes. The *English for Academic Purposes in Southern Africa Series* (Murray and Johanson 1989, 1990, 1991a, 1991b) is used as a basis for suggestions for computer assisted exercises using a range of different computer programs.

The Appendices contain examples of data gathered during discussions with teachers, and examples of exercises devised to illustrate the suggested approach outlined in Chapter 8.

Chapter 2

Research Method

The research method used for this project is described first in practical terms. Details of the actual activities and the recording of activities are given. This description is followed by an analysis of the method which places the work in a theoretical perspective and evaluates its suitability for the tasks at hand.

2.1 Research Aims

The broad aim of the research was to survey and assess computer assisted materials which could be used to support language development programmes in Academic Development Programmes at Universities. A narrower aim was to identify areas of language teaching and learning in this context which could benefit from a computer assisted approach but for which suitable materials are not available, to develop and test computer programs, and to identify existing programs, which would address needs in the identified area.

2.2 A Practical Description of the Research Method

The achievement of the broad and more specific aims described above shaped the research method used. The research consisted of a number of different but related activities which were carried out in cycles. The major activities were:

- Literature review and collection of resources
- Analysis of language teaching approaches and materials
- Development of the computer system
- Evaluation of the computer system
- Placing the development in a broader context

These five major categories of activities were carried out over a period of approximately one and a half years in two major cycles. At times these activities overlapped as dictated by the opportunities for and constraints on the research. In the section of this chapter which analyses the method in theoretical terms it will be argued that this rather loose research method is suitable and in some respects necessary for the type of work which was done.

2.1.1 Literature review and collection of information and resources

This phase of the research involved building up a bibliography of relevant writing in this field, locating books and journals, and reading to get a broad overview of the field. In addition to reading it was necessary to contact a range of tertiary educational institutions to find out what research and teaching were being done in this field. Although particular attention was paid to these activities at the start of the project, the collection of information and resources continued throughout the research project.

2.1.2 Analysis of language teaching materials and approaches

A range of language teaching materials used in language development courses was collected from tertiary institutions. These include the EAP Series; the Learning, Language and Logic (LLL) course (John et al. 1991); the University of the Western Cape English 1 Editing Course (UWC 1993), the University of South Africa English for Science Students guide (Richmond 1988), a porposed English course for Vista University (Smith 1993), and materials used over the years in the Academic Skills Programme at Rhodes University. The materials were assessed in order to judge to what extent they could be implemented with the computer medium.

Although many possibilities for developing instructional programs were suggested by a consideration of the materials, the approach used in *Write to Improve* (Murray and Johanson 1991) seemed to hold much promise as it was feasible to implement with the computer medium and is very widely used in language development programmes.

2.1.3 The development of a computer system

An intensive phase of planning and implementing computer programs followed. During this time the basic conceptual design of the programs was completed and the main algorithms for text representation and student-program interaction were programmed. Details of the development phase are given in Chapter 5.

2.1.4 Evaluation of the computer system

Early versions of the computer programs were shown to colleagues and fellow researchers and notes were made of responses.

Two series of evaluation workshops were run - one with a group of six language teachers and the other with a group of six students. In the teacher workshops the programs were demonstrated and the discussion which followed was audio-taped and later transcribed. The student sessions involved the students in using the programs. Observations of student responses were recorded in writing by the researcher during and after the sessions.

The researcher also presented conference papers and a poster documenting the development of the system. Notes were kept about responses in these situations.

2.1.5 Placing the development in a broader context

In order to understand how the system which was developed could be used within a broader approach to computer assisted language learning, various other software was acquired and evaluated. The evaluation of this software was generally of a speculative nature by the researcher as it was beyond the scope of the research to do thorough testing with students for a range of software. Where possible the opinions of language teachers were gathered by individual consultation and by running workshops.

2.3 The Research Method in Theoretical Perspective

Cohen and Manion (1989:40) characterise the interpretive approach to research by listing the following descriptive terms:
"individual; small-scale research; human interaction; continuously recreative social life; non-statistical; 'subjectivity'; personal involvement of the researcher;..." According to the expanded meanings given to these words by Cohen and Manion, the approach taken to this research is clearly interpretive rather than normative. No attempt has been made to formulate and test hypotheses. The research is rather the collection of work done in the search for a workable model for computer assisted language programmes in a particular context. Walker (1992:475) includes Action Research, case study and qualitative evaluation in the domain of practitioner research.

2.2.1 Action Research

The research method used in this project is most accurately described as Action Research. The method is defined by Halsey (in Cohen and Manion 1989:217) as follows: "Action Research is small-scale intervention in the functioning of the real world and a close examination of the effects of such intervention."

According to Cohen and Manion (1989:217) the important features of Action Research are that it is

> "**situational** - it is concerned with diagnosing a problem in a specific context and attempting to solve it in that context; it is usually (though not inevitably) **collaborative** - teams of researchers and practitioners work together on a project; it is **participatory** - team members themselves take part directly or indirectly in implementing the research; and it is **self-evaluative** - modifications are continuously evaluated with the ongoing situation, the ultimate objective being to improve practice in some way or other."

These four features apply to a large extent to the research method used in this study. The research is strongly situational, being concerned with the problem of supporting language teaching in the academic development context within a particular university. It is collaborative: the author cooperated with members of staff in language departments, the Education department and the Academic Development Programme in the university. In addition there was cooperation with staff members from two other universities. The research is strongly participatory as the researcher was directly involved in all phases of the research. Lastly, the research is self-evaluative. The emphasis throughout has been on searching for a workable model of using computers to support language teaching and learning. Because of this, a considerable amount of the research has entailed evaluating the development work in order to determine its place in a learning programme.

Cohen and Manion (1898:217) also cite Blum's resolution of action research into a **diagnostic stage** and a **therapeutic stage.** In the former, hypotheses are developed and in the latter these are tested by a consciously directed experiment to change the situation. In this project a cycle of problem identification and specification, program design, testing, modification and contextualization has been followed. In this sense the research adhered to Blum's stages as described above although specific experimental hypotheses were not generated and tested.

Action Research is further described as follows:

> "... the method's evaluative frame of references ... [is] to add to the practitioner's functional knowledge of the phenomena he deals with. This type of research is therefore usually considered in conjunction with social or educational aims." (Cohen and Manion 1989:218)

This describes accurately the position of the author in the current research - that of developing knowledge and experience in the field of CALL for the purpose of addressing perceived problems or alleviating constraints in academic development environments.

In summary, it has been argued that the Action Research methodology is most suited to projects of the kind described here. Because the aim of the research was to encourage innovation and

the development of materials, it was necessary that the methodology should encourage a situational, collaborative, participatory and self-evaluative approach. Indeed, the adoption of the methodology at an early stage in the research contributed greatly to keeping the research focused on the needs of language teachers and learners and in basing technical development on these needs rather than solely on the ideas of the developer.

Chapter 3

Academic Development and Language Development

Language Development courses or English for Academic Purposes (EAP) courses in South African Universities are most often offered as part of a more general academic development programme. It is important to recognise this context. The nature of ADPs, their aims and objectives, clientele and constraints, affects the approach taken to language development. Agar et al. (1991:3) argue that educational support programmes (ESPs[1]) have arisen from the interplay of a number of different factors:

- A small pool of black matriculants with mathematics and science;
- High failure rates at universities;
- More blacks at white universities;
- A shortage of high-level manpower;
- Over-subscription to university education;
- Under-provision of vocational and technical education; and
- Segregated, unequal education systems.

Commenting further on the origin and nature of ADPs, Agar et al. (1991:4) state :

> "All these factors can be properly understood only in the context of an apartheid society which is in transition and suffering from a legitimacy crisis coupled with mounting economic difficulties. Education has become a focus of the national crisis and the struggle for a new society."

In assessing the importance of the AD field Agar et al. (1991:48) claim:

---

1. The acronym **ADP** (Academic Development Programme) is used subsequently in this section to describe these programmes, termed ESPs by Agar et al., so as to avoid confusion with the more general use of ESP - English for Specific Purposes.

"Despite its many problems and complexities, the ESP [ADP] field is seen as an important area for the development of a post-apartheid South Africa. It can offer immediate opportunities for improving the life chances of many black South Africans, it can assist the development of future leaders and high level manpower, and it can provide a means for facilitating change in tertiary institutions. In all these ways, the programmes can be bridges to the future."

For the purposes of this study it is important to understand in general terms the objectives and functioning of academic development programmes. What specific needs do they address, for whom are they intended, what perceptions exist about their effectiveness and efficiency, what problems do they face, and how can they be improved? These questions will be discussed with specific reference to language development programmes and the use of computers in supporting these programmes.

3.1 Academic Development Programmes (ADPs)

Agar et al. (1991:5) state that ADPs typically have three aims:

"• The qualitative and short-term aim of facilitating and enriching learning or teaching;
• The quantitative and medium-term aim of increasing the number of black students who graduate, who succeed in the professions and who reach leadership positions; and
• A long-term aim of contributing to structural change, in terms of a vision of a nonracial, democratic, post-apartheid South Africa, by changing institutions, attitudes or structures in the wider society."

While the researcher questions whether the first aim is in fact short-term, the three aims as stated here realistically reflect the broad aims of most programmes of this type.
The following abbreviated objectives of the Rhodes University ADP exemplify the above aims:

- To present a **staff development programme.**

- To plan and present a student development programme of **foundation courses and skills modules.**
- To facilitate **course evaluations.**
- To conduct **research** in the field of academic development.
- To provide an **academic monitoring and counselling** service.
- To promote and coordinate **academic development initiatives for high-school students,** particularly from disadvantaged local communities, in order to improve preparedness for university study.

(Rhodes Summit Report 1993:10)

3.1.1 The Clientele of ADPs

A stereotype of the student who attends ADP programmes is a student who is black, matriculated at an under-resourced school (probably Department of Education and Training), may be relatively mature, and has English as a second or third language. However there are also a significant number of students who attend development programmes who do not fit this profile. There is an increasing acknowledgement that previously white secondary education has been experiencing its own crises which contribute to the lack of preparedness of students entering universities. While it is accepted that student support is necessary regardless of institutional and socio-political conditions, there has been a gradual shift in emphasis in ADPs away from remediation towards a more holistic view of development involving the institution, its programmes, staff and students.

3.1.2 The Effectiveness and Replicability of ADPs

Agar et al. (1991:13-18) show that evaluation of ADPs and the question of effectiveness are complex, involving a number of factors. The following factors are considered to have an important bearing on the effectiveness of ADP's:

- the experience of ADP staff;
- whether there is enough emphasis on developing proficiency in language and numeracy;
- whether there is adequate time-on-task;

- the degree to which courses are contextualized; whether they provide relevant subject knowledge and skills;
- the use of new technologies;
- effectiveness of teaching/learning strategies.

ADPs tend to be highly self-reflective, continually evaluating their practice according to factors such as those listed above. However, the measurement of effectiveness of ADPs by quantitative methods is difficult and in some respects problematic in that it may lend support to a limited view of AD as a remedial service.

Concerning replicability of ADP models Agar et al. (1991:-v-) state that

> "A distinction must be made between an ideal model of effectiveness and replicable models of ESPs [ADPs]. Replicability can be examined in terms of transferability, scale of need, and affordability. Effective ESPs [ADPs] for students cannot easily be replicated because they are expensive, they can cater for only a limited number of students, they are labour intensive and they face varying degrees of resistance in different institutions and different parts of the same institution."

These cautions notwithstanding, the AD field is characterised by a search for workable, replicable models. Often the resources for implementing these models are meagre and the expectations of success great. For example one campus of Vista University with overwhelming developmental needs has a single staff member involved in student development. Given this situation it is vitally important that duplication should be avoided, materials shared, and innovative methods be sought to support programmes which are under severe pressure.

3.2 Language Development Courses and Academic Development

ADPs have recognised language competence as a major skill which students need in order to succeed in tertiary education. As a result a number of English language development programmes have been established. Before describing some of these courses it is necessary to

consider in more detail the assumed link between English language competence and academic achievement.

3.2.1 English Language Proficiency

The introduction of language development courses in ADPs and particularly as important components of foundation or bridging programmes can be motivated on different levels. In practical terms it is clear that most English second language students have difficulty succeeding at English language institutions. Although these students typically face a number of other barriers to success (inadequate school background, cultural and institutional adaptation problems, financial and social problems, accommodation difficulties) the linguistic barriers are immediately apparent to students and teachers. Empirical evidence clearly shows that fewer ESL students than EFL students succeed in tertiary education. For example at Rhodes University in 1992 86% of EFL undergraduate students passed two or more courses, while only 61% of ESL students passed two or more courses. The apparent clarity of the problem on a practical level is usually taken as sufficient justification for the introduction of language development initiatives in AD programmes or across institutions. For instance, the introduction of the English for Academic Purposes course at Rhodes University has been accepted on these grounds without much detailed discussion of pedagogic considerations. However, the planning and teaching of courses makes it necessary to consider such courses from a more fundamental and theoretical point of view. In particular theoretical conceptions of language proficiency should be considered and the relationship between language proficiency and academic achievement explored.

Stern (1983:357) classifies studies on language proficiency into four approaches: theoretical conceptions, rating scales, formal proficiency tests, and interlanguage research. He argues that these approaches complement each other and could be used more effectively in developing a better understanding of proficiency.

The table in Figure 2 (Stern 1983:356) summarizes various conceptions of proficiency and is reproduced here in order to place subsequent discussion in context.

relatively abstract

relatively concrete

Single concept	Twofold concept	Threefold concept	Fourfold concept	Multiple categories
Example	Example	Example	Example	Example
Expectancy grammar (Oller) Linguistics competence (Interlanguage studies/error analyses)	Linguistic Competence Communicative competence CALP BICS (Cummins)	Grammatical Competence Sociolinguistic Competence Strategic Competence (Canale and Swain)	Listening Speaking Reading Writing	Specification according to: Roles Settings Topics Functions Notions (Council of Europe)
			Formal mastery Semantic mastery Communicative capacity Creativity (Stern)	Phonology/ Orthography Lexicon Grammar in relation to Listening Speaking Reading Writing (Carroll)

Figure 2: Interpretations of Language Proficiency

Graham (1987) cites research which clearly indicates that the relationship between English language proficiency and academic success is by no means simple or proven. While some studies indicate statistically significant positive correlations between measures of English language proficiency (such as the Test of English as a Foreign Language, TOEFL) and measures of academic success (such as first semester grade point average), many studies do not. Graham lists problems associated with such academic prediction studies: criteria for judging proficiency and

success, the validity of measures, the interpretation of results and the large number of uncontrolled variables. She cautions that English language proficiency is only one of many factors affecting academic success and that student admissions policies should take this into account. Figure 2 shows that there is a range of conceptions of proficiency. This complicates the task of measuring proficiency.

However, findings reported in the study by Graham support the common intuition that a certain minimal level of proficiency is required for academic success and that empirical studies may be inconclusive precisely because the subjects of these studies generally satisfy the minimum requirement. The significant resources allocated to ESL teaching in British and American universities indicate a widespread practical conviction of the link between proficiency and achievement regardless of some theoretical findings to the contrary.

The literature surveyed yielded only a few references to language proficiency testing in the academic development context in South Africa. Van der Ham (1991:222) reports the introduction of language proficiency testing at the University of Durban Westville in order to identify "students who had been disadvantaged by their formal education and were likely to fail because of inadequate language skills." However the constraints on the testing and the newness of the initiative made it impossible to establish the predictive validity and the suitability of the test.

While some faculties at universities give a greater weight to matriculation English results in determining a point rating to be used for student admissions, this is not general practice. The trend, particularly in alternative admissions programmes like the Teach Test Teach Programme at the University of Natal (TTT Brochure 1993) is rather to assess the student's academic potential in a more holistic way.

While the research evidence considered is not conclusive about the nature of the link between language competence and academic achievement, it does seem clear that the language proficiency of many ESL students is below the threshold required for academic success at historically white

universities and that more concerted efforts need to be made to improve language proficiency if success rates are to improve.

3.2.2 Approaches to Language Learning

Chamot and O'Malley (1987) have espoused a Cognitive Academic Language Learning Approach (CALLA) which includes three main components: "a curriculum correlated with mainstream content subjects, academic language development activities, and learning strategy instruction." The important objective of the approach is to assist the student in acquiring a complex of related skills which will enable him to cope with a mainstream academic programme. Chamot and O'Malley (1987:238) use Cummins' framework to classify language and content activities on two continua. This is represented in the diagram below:

	Cognitively Undemanding Activities	Cognitively Demanding Activities
Context-embedded	I	II
Context-reduced	III	IV

Figure 3: Cummins' Framework for Cognitive and Language Activities.

The CALLA approach is designed to assist the student to acquire skills which will enable him to perform Quadrant IV activities successfully. Quadrant IV activities are cognitively demanding and context reduced. The approach seems to provide a particularly useful model for approaching language development courses for ESL students because it links language competence with academic skills and demands in a coherent way at the cognitive level. It then goes further to integrate this into learning strategy instruction. This involves linking metacognitive, cognitive and social-affective strategies. Conceptually, the approach adequately takes into account

Graham's cautions regarding the complex link between language competence and academic performance, yet recognises the qualitative difference between students at the basic communicative competence level (quadrant I) and those who have developed a degree of cognitive academic language proficiency (quadrant IV).

Approaches such as CALLA, which are motivated strongly by the needs of the English second language student, should be seen also in the context of general trends in language teaching. Trim (1992:10) sees two major emphases as having become generally adopted in the past decade: "acceptance of communication in its manifold aspects as the central function of language and the development of communicative competence and proficiency as the central aim of language learning and teaching" and "the learner as an agent rather than as a relatively passive recipient of teaching." According to Trim, the consequences of these major emphases are: an increased concentration on contexts and functions for language learning; a shift in emphasis on formal grammar for its own sake to its usefulness in organising discourse and meaning; assessment and evaluation based on communicative competence "rather than on structural manipulation or discrete item objective testing" (Trim 1992:10); more consciousness of the learner's culture, interests and needs.

These trends in language teaching and in particular the development of academic language skills for English second language learners have understandably informed practice in language courses in the AD field in South Africa.

3.3 Language Development Courses at South African Universities

3.3.1 University of Bophuthatswana

At the University of Bophuthatswana (UNIBO) a Special English (SPEN) Unit was created in 1980. Its task was to develop and implement a Special English course. Since then the course has become a compulsory, credit-bearing course for all UNIBO students. SPEN has been evaluated by Agar (1990) who concludes that

" ... the course, as it is, is appropriate, useful and effective in terms of its content, the level at which it is pitched and in terms of student and staff attitudes and needs. It should remain a credit-bearing and compulsory course for all UNIBO students for the foreseeable future."

Ngwenya and Hossfeld (1991) report that the basic language skills of many students at UNIBO are not well enough developed to enable them to cope with the Murray and Johanson materials used in the SPEN course. They propose more basic language skills training for such students. This illustrates the extremely low level of student English language competence.

3.3.2 The English for Academic Purposes (EAP) Series

The SPEN materials have been published as the *English for Academic Purposes in Southern Africa Series* (Murray and Johanson 1989, 1990, 1991a, 1991b) which comprises a guide and three workbooks. The approach to EAP which is developed in this series has been adopted by academic development programmes at a number of universities.

The approach used in the materials is holistic, emphasising authentic learning tasks and creating a context to which students can relate. Meta-cognition is emphasised: students are encouraged to become self-aware and critical. Reading and writing as seen as cyclical processes involving frequent analysis and synthesis.

Language is viewed and handled according Krashen's monitor theory: "adults have two independent systems for developing ability in second languages, subconscious language acquisition and conscious language learning" (Krashen in Murray and Johanson 1991:3). Conscious learning of a language is available as a monitor only: the acquired system is used to produce language, and the monitor to correct performance. The idea of the monitor is implemented in the form of a marking key and a guide to the marking key. This is used by teachers and students as a standard means of communicating about problems and errors in student writing.

The course is task based, emphasising active learning and time management. It encourages different methods of classroom management: individual, small group, and whole class. The variety is intended to encourage different and appropriate opportunities for interaction. The course emphasises learning rather than teaching and the teacher is seen as a "facilitator of learning", providing a good learning environment, planning activities, sharing knowledge and experience, providing feedback and responding to individual student needs.

3.3.3 Other University courses

Other universities such as Natal, Witwatersrand, Western Cape and Cape Town have also developed credit-bearing English language courses intended mainly for ESL students. Practitioners and researchers report various strengths and weaknesses of their respective courses (Clarence 1991, Dison 1993, Ngwenya and Hossfeld 1991, Volbrecht 1992). Agar et al. (1991:34) report that a major criticism of these general language courses is their general nature which makes it difficult for students to apply what is learnt. In response to this problem there is a discernable move towards content based language instruction and English for Specific Purposes (ESP) as well as specific language skills development at the individual level. There is thus a tension between the need to provide credit-bearing general EAP courses and less formal but more personalised English language development modules and services.

Many of the historically black universities, which have a majority of ESL students have credit bearing practical English courses. These courses are often service courses required in a degree curriculum and run the risk of being seen by students as soft options or irrelevant (Dison 1993). The EAP Series is widely used as a text or major source in these courses. Full English I courses at some universities include a substantial language development component of a more functional rather than formal nature (e.g. Smith 1992). In addition to credit bearing courses language development modules are offered by institutions. For example, Hondy (1991) reports positive student perceptions towards skills development offered by the Division of Language Usage at the University of Durban-Westville. However, students are less confident about the usefulness of the course in improving academic success in the form of examination results. Goodyear (1993)

reports positive student responses to a language development course as part of a foundation pre-technician course at the Port Elizabeth Technikon, with particularly favourable experiences of using dialogue journals.

3.3.4 Rhodes University language development programmes

The Academic Skills Programme at Rhodes University has run English language development tutorials and courses for a decade. Jefferay's (1993) outline of these developments shows the influence of the dominant thinking in this field including the use of the EAP series and the application of Cummins' concepts of BICS and CALP. Tutors have consistently attempted to work with the individual student and small groups in order to develop language competence and improve academic skills. The extent to which the work has taken place within the context of the disciplines being studied by the student has varied. The advantage of such smaller projects over credit-bearing courses is that tutoring can be tailored to specific students or groups of students more easily. The disadvantages are substantial. Since the approach is tentative and flexible, there are frequent changes in methods, policy and materials. This can result in the loss of impetus in a small project. Jefferay (1993:8) documents some of these difficulties: student work load in mainstream courses (implying insufficient time on task); the difficulty of tailoring approaches to individual needs; and staff continuity.

A credit-bearing course, English 1AP (English for Academic Purposes) will start at Rhodes in 1994. It is envisaged that the course will form an integral part of foundation programmes in the faculties of Commerce and Science and will be offered as an ordinary credit to students in the Humanities. The course will include ESP components for specific groups (like Commerce and Science students) so that students can apply language skills to learning in other disciplines.

This brief description of AD programmes and language development programmes within the AD field shows a considerable range teaching methods, curricula and student needs. However the field is characterised by a significant degree of cooperation between institutions and common materials and theoretical bases for practice are evident. The EAP Series has clearly been the

most influential source. However the scale of need in these programmes seems vast. Innovations, often based on similar approaches, have varied success due to local conditions and constraints. A major constraint is that there are insufficient teachers and tutors to cope with the intensive demands of these courses. It is from this perspective that computer assisted approaches will be considered in later chapters.

Chapter 4

Computer Assisted Language Learning

The preceding discussion shows that ADPs have relatively far-reaching goals. There is also an increasing number of students who need or desire the support of ADPs. To put it another way, there is an increasing urgency for university programmes to adapt to the needs of the student intake. At the same time there are severe constraints on the effectiveness and replicability of ADPs. Human resources are under pressure. Given these circumstances it is important that research should be done on alternative methods which could alleviate some of the constraints. The use of computer assisted methods is an alternative method which has potential and has so far not been used widely in AD. There are many possible reasons for this. ADPs generally lack sufficient resources to employ enough staff to attend to identified needs. Educational technology is thus low on the priority list. Another reason may be resistance on the part of ADP staff and students to 'canned', technological approaches (see Manie 1990 for example). It is also clear that innovations of this kind take time to implement and to become integrated meaningfully into other aspects of courses.

4.1 Computers and Academic Development

Computer assisted methods have potential as alternative methods for ADPs in a number of ways:

- Diagnostic testing which aims to inform ADPs of the needs of students and also to tailor remediation or extension to student needs could benefit greatly by being 'computerised'.
- The availability of study material and access to guided practice and remediation with a tutor could be 'multiplied' by the use of good quality tutorial software. Of course there are significant overheads involved in the production of software and the maintenance of delivery systems.
- The opportunity for individualising instruction and learning could be enhanced by computer assisted methods.

- Computing skills per se would be a by-product of the use of computer-assisted instruction. These skills are becoming increasingly important in the academic environment and students who do not have the opportunity to learn them may be disadvantaged.
- If CAL facilities are open for extended hours there may be great gains in the flexible use of student and tutor time. The extent to which scheduling group tutorials or lectures inhibits the work of ADPs may be significant.
- The relative anonymity and individual nature of the computing medium may be an important advantage where there may be a stigma attached to attendance of 'remedial' sessions.

In addition to these largely pragmatic potential advantages of using computers there are a number of ways in which CAL has the potential to improve the quality of the learning process. Alessi and Trollip (1989) discuss eight issues in Cognitive Psychology which need to be taken into account in the design and development of CAL software: Perception and attention, memory, comprehension, active learning, motivation, locus of control, transfer of learning, and individual differences. It is not within the scope of the present argument to discuss these in detail but it seems that interactive software which ensures that students can learn at their own pace and provides options for individual exploration and control of the learning process would have significant advantages in the majority of these areas when compared with predominant traditional learning modes such as the lecture.

The above claims are also based on studies of CAL use by students at Rhodes University over a number of years (e.g. Collett and Vermaak 1993). Further substantiation is provided by the reported advantages of using CAL in the Computer Supported Education Unit at the University of the Western Cape (Manie 1992) and the PLATO project of the RBM Computerised Resource Centre at the University of Zululand (de Nieully Rice 1992). International journals in the CAL field include many studies over the past two decades which claim success in the use of CAL.

4.2 A Review of CALL Program Types

Having argued that there are good grounds for researching the use of computer assisted methods in ADPs, and against the background of the information about existing language development courses, it is now necessary to return to the earlier claim made that it is feasible to develop and implement computer assisted language development materials for ADPs.

The question to address is: What kinds of computer programs are available or can be developed to create an environment which would significantly enhance the development of language skills of students? A related question to consider is: Given that such an environment can be created, to what extent can it replicate the functions of tutors and group work in existing programs or improve the effectiveness of teaching and learning?

In attempting to answer these questions it will be useful to present a short overview of the field which has become known as CALL - Computer Assisted Language Learning. Based on his bibliography of CALL, Jung (1992:32) ranks the following subjects as having received the most attention in the decade from 1980 to 1990:

1. English as a Foreign Language
2. Tertiary Level
3. Software (Design)
4. Word Processing
5. French as a Foreign Language
6. Writing
7. Interactive Video
8. Reading
9. German as a Foreign Language
10. Artificial Intelligence
11. Data Bases
12. Evaluation
13. Authoring Systems
14. Simulations
15. Grammar Teaching
16. Hypertext
17. BASIC
18. Vocabulary Learning
19. Text Reconstruction
20. Telematics
21. Spanish as Foreign Language

Figure 4: Jung's Ranking of CALL Research Areas

Although this ranking is somewhat misleading because of the mixture of languages, methods and technologies, it does show the prominent concern with English as a Foreign Language at the tertiary level and also gives a general indication of CALL concerns and priorities. The following section describes CALL approaches and methods which seem to the researcher to have potential relevance to language development courses in the AD context.

4.2.1 Computerised Language Testing

Several computer applications are available (e.g. QuestionMark) which make it relatively simple for a non computer specialist to develop objective language proficiency tests using a range of question formats. Custom written tests of proficiency which have been standardised statistically are also available. A good example is the Eurotest language proficiency tests (Eurolinguist 1993).

4.2.2 Instructional Programs

For some years the computer has been used to present language tutorials and exercises. For example, the PLATO system has a large library of such programs which deal with a wide range of topics in the areas of lexis, grammar, structure and style. As early as 1980, Borello and Italiani report using CAL to teach a course in generative grammar. Watson (1986) makes the point that such CAL materials become much more effective if the content can be customised by the teacher and if the material stimulates the learner to use language both at and away from the keyboard. This mode of using computers in language learning corresponds with Taylor's (1982) "tutor" mode.

4.2.3 Exploratory Environments

Compact disk and multimedia technology has been used to create visual environments for language learning. Typically the student using such materials would explore a graphic display and see and hear language associated with objects and concepts in the display. Interactive

opportunities exist through typed and spoken input by the student. These systems can respond to typed input but not to spoken input. An example of such a system is the CAMILLE system (Ingraham:1993).

4.2.4 Intelligent Tutoring Systems

Underwood cautions that computers should not be used merely as teaching machines in the language laboratory mode. He argues that

> "... artificial intelligence strategies will radically improve the kinds of exercises that can be done, and that they will prove especially useful when integrated into a larger CALL environment, one which combines AI technology such as natural language processing with other tools for delivering instruction, such as hypermedia and simulations."
>
> (Underwood 1989:71)

Recent work in the field of intelligent tutoring systems in the area of language learning (Bull et al. 1993; Puntambekar 1993; Suri and McCoy 1993a,1993b) shows that progress is being made in this field. However, these systems are still under development and tend to deal with small knowledge domains.

Higgins (1988:19) is pessimistic about intelligent tutoring systems for language teaching, describing them as having "no breadth of knowledge", "no ability to find illuminating comparisons", "insensitive, with few channels to get messages from the learner", and having "no love or enthusiasm to share". The researcher has seen little evidence of natural language understanding in multimedia systems and must conclude that intelligent applications which will be useful in a realistic language learning environment will take some time yet to become available.

4.2.5 Writing tools

Perhaps the most natural use of computers in education is in the area of writing development. A range of software can be used. Word processors, including spelling, grammatical and style

checkers, thesaurus and dictionary facilities can be used in the composition process. There is a wealth of writing about the educational use of such tools. A selection from readings is presented here.

Word Processors

The use of word processors in the language classroom has focused attention on a process approach to writing. A product approach is seen to be outmoded and ineffective. A number of positive effects are claimed for using word processing in a process approach. Most authors make the obvious point that drudgery in the revision and refinement of writing is significantly reduced by word processing (Balajthy 1986; Ritter 1986; Kahn 1987). Further claims are that students develop a more positive approach to writing (Piper 1988; Rodriguez in Balajthy 1986); that writing quality is improved by the increase in the number and complexity of revision operations (Collier in Balajthy 1986); that the writer is more free to experiment and think without committing to paper (Kahn 1987). Enthusiasm for the positive effects of word processing is tempered by the following realisations: the use of the tool does not guarantee better quality; the teaching of process writing has much to do with the teacher's role in providing encouragement and meaningful feedback (Balajthy 1986); teaching the mechanics of word processing can obscure the writing task (Leonardi 1986).

Windeatt (1987) also catalogues the apparent benefits of word processing in the writing process without presenting empirical evidence. However he makes valuable suggestions for the use of word processing in a more instructional mode. Many of the language learning exercises suggested are easy to implement and are adapted from similar exercises with pencil and paper. It is worth describing some here.

"Blind typing" refers to an exercise designed to improve the fluency of student writing. The brightness of the computer screen is turned down and students write freely about a subject for a limited time. Afterwards they attempt to improve the structure and accuracy of their writing.

Text repair type exercises may require the student to modify or correct text to address redundancy, misspelling, grammatical error and errors of fact. Cloze exercises can also be set up easily.

The marking and moving functions of word processors can be used in exercises which require students to order jumbled text. Such exercises provide practice in the structure of text and arguments and also in the recognition and understanding of the use of the connective devices and discourse markers. Search and replace functions can be used effectively to examine concord. For example, all occurrences of a personal pronoun in a text can be changed from singular to plural or from masculine to feminine and the student is required to correct resulting concord errors.

In addition to these specific language learning activities, Windeatt suggests study skills exercises which may benefit from being done on a word processor. Students may be given a text and asked to make summary notes by picking out key or topic sentences. Conversely lecture notes may be expanded into fuller versions of the lecture in order to test the coherence, accuracy and comprehensiveness of the notes. Students could be given the text of the lecture for comparison with their own expanded versions.

Auten (1988) concludes that although there is much useful information on the teaching of writing as a process, and many examples of using word processing for this purpose, a relatively small proportion of language teachers teach writing in this way. Auten argues that this is due to narrow curricula and standardised testing. However it should be recognised that so far studies in this field have not provided conclusive empirical evidence of significant gains stemming from the combination of process writing instruction and word processing.

4.2.6 Concordancing Programs

Johns (1993) has coined the phrase *data-driven learning* to describe an approach to language teaching which involves the teacher and the learner in looking closely at the way language is

actually used in texts. This approach relies quite heavily on the collection or acquisition of a body of written language in a computer readable form, called a *corpus*. Computer programs known as concordancers are used to process the language in the corpus. The following quotation introduces the basic terminology used in this field:

> "If a corpus is to be useful, we obviously need to be able to search it quickly and automatically to find examples of a particular linguistic phenomenon (say, a word), to sort the set of examples as required, and to present the resulting list to the user. The kind of program which performs these tasks is a **concordancer**, and the output it produces is known as a **concordance**. A concordance is a list of all the examples of the **target item** (the linguistic item being searched for), normally accompanied by enough context to enable a human being to study the item's occurrence in detail. The list can be ordered alphabetically , or on some other principle." (Leech and Fliglestone 1992:127)

The approach taken by Johns is interesting because it combines a concern for the formal study of language with a student-centred, problem posing and solving approach. Previous approaches designed to introduce the student to a more formal study of the grammar or linguistic properties of English have always run the risk of alienating students by being dry, formal and removed from the students' need to improve functional competence. They may also perceive that formal study is irrelevant since they are already functionally competent in everyday communication.

Johns casts the teacher and the student in the role of language researchers. In particular he sees the teacher in two possible roles: Reactive, where the teacher gives the student the initiative and acts to assist the student's research into language usage; and Proactive, where the teacher takes the initiative in researching patterns of language use, collects examples of usage and structures exercises which will help the student to understand the patterns.

Tribble and Jones (1990) provide a number of useful examples of how interactive concordancers can be used in the classroom. Among the objectives of the activities they describe are:

"to increase learners' understanding of the position of adverbs in English"; (58)
"to look at some ways in which adjectives are qualified and to extend the learners' knowledge of collocational restrictions on common adverbs"; (63)
"to establish an appreciation of appropriate use of sentence conjuncts in formal academic writing". (66)

The last-mentioned objective relates to a lesson plan of five stages in which students compare the use of sentence conjuncts in "learner" and "expert" writing, with the aid of a concordancer program and a small corpus of text of each type. From the word lists extracted from the corpus a list of "linking words" is drawn up. Then a concordance of these words is requested and patterns of usage are analyzed and compared. Students report their findings. Finally students may be asked to edit a piece of learner writing in which conjuncts are poorly used.

The examples from Tribble and Jones clearly show the student in the role of the researcher and the teacher in both the reactive and proactive roles (depending on the situation) as described by Johns. This model would seem to have rich potential for application in the context of language programmes in academic development environments in South Africa. Following the example described above, a corpus of academic writing, for example lecture notes and texts, and another corpus of student writing could be collected. Depending on how the corpuses were to be used, it might be necessary to restrict them to a particular discipline or set of related disciplines. Then using concordancing as a tool, students could be encouraged to research many different aspects of language usage. Comparison between expert and learner writing could be used to good effect. Some possibilities would be the investigation of concepts and specialist vocabulary in a discipline and related student difficulties; conjuncts and cohesive devices; affected, pompous or clichéd usage or jargon; gender specific terms. In this regard it may be interesting to investigate how grammar and usage checkers could be used in conjunction with concordancers to research usage patterns in learner texts.

The suggested use of concordancing would naturally depend on the ability and interest of students to get involved in this sort of research about the language. This would need to be tested before any claims could be made about the usefulness of the approach. It would, however, be quite

feasible for language teachers to use concordancing in this way to extract highly relevant material for more formal student practice exercises even if students were not ready for an exploratory approach. Smaller concordancers such as the Longmans Mini-Concordancer (Chandler 1989) and MicroConcord (Scott and Johns 1992) are quite adequate for this purpose.

4.3 Examples of CALL projects at South African Universities

The English Grammar Project at the University of Zululand seems to be the most concerted local effort to use computers in a language development course. A computer-based English grammar course has been implemented on the PLATO system in response to a perceived need for formal grammar instruction. Voss (1992) gives a detailed rationale for the course. The course consists of interactive study materials divided broadly into tutorial type programs (from the PLATO library) and a range of tests and drills (developed locally and drawing on the EAP Series materials). Students' use of the materials is managed by a custom-written CMI system. This project uses the computer exclusively in the "tutor" mode. While evaluations of the course are not yet available, Voss (1992) reports that student comments have been positive. Experience at Rhodes University with GRATEP (a bridging project) students and university English I students using the same PLATO programs has shown that students voluntarily spend a considerable amount of time (up to 50 hours) studying the language programs. Responses to a questionnaire administered by the researcher showed that students thought they had learnt a great deal from the programs. There is clearly a need for a more objective evaluation of the effectiveness of instructional programs of this type.

The Department of Language Usage at the University of Durban-Westville has included an extensive computer-based component in its language development course. A range of software types has been used but there is a strong emphasis on reading development (Naidoo 1992).

An English One Editing Course (UWC 1992) has been developed jointly by the Academic Development Centre and the Computer Supported Education Unit at the University of the Western Cape. The aims of the course, as stated in the introduction of the workbook are:

"to encourage students to become more aware of their expression when editing their own writing;

to teach students some points about English language in order to help them make their writing more accurate and easy to read;

to make students more familiar with the tutor's abbreviations and comments on their essays."

The course covers the following topics: Writing concisely and word forms; conjunctions and sentence structure; verbs and tenses; vocabulary; concord; prepositions and phrases; punctuation; and structure in writing.

Computer programs have been developed which are used with the workbook to provide additional information and a more interactive learning experience. The programs and the workbook have been designed to be used together. The programs depend on reference to the workbook at some points, but the workbook may be used as a learning resource in its own right.

The computer programs provide interaction but possibly at too low or obvious a level. The interaction is in the form of exposition followed by questions and answers, sometimes with reference to texts in the workbook. The programs are in the traditional CAL model - fixed content and predetermined learner paths within a broad menu system. The main advantage is introducing an interactive learning component into the course. This may be highly significant in encouraging independent study by students in very large classes. The course is in its first year and student feedback has been collected on the computer system which should be useful for a review and evaluation of student experience of the course.

Paxton (1992) reports a concern with improving writing skills at the University of Cape Town and provides theoretical background and a review of American experiences with Writing Centres as a background to describing a proposal for the establishment of a Writing Centre at the university. The aim of such a centre would be to create an environment where trained peer tutors would be available to engage with students in critical but supportive dialogue about their writing as a means of improving writing. A related aim would be to encourage the concept

throughout the university so that it becomes part of the approach in mainstream programmes. A quote from the paper illustrates the rationale for the development: "Writing is the way in which many academics conduct enquiry into their disciplines. Therefore, just as students need to be trained in ways of knowing in a particular discipline, so their need to learn how to write in the discipline and the teaching of writing needs to be built into the curriculum." (Paxton 1992:312)

It is planned that the development would be linked to the Computer Literacy course of the Academic Skills Programme. It is likely that computers will be used more as a tool in this context as compared to the dominant tutor role in the UWC editing course. Coordinators for the Writing Development Centre have recently been appointed and it is clearly too early to evaluate the approach.

Although the preceding review of local computer applications in language teaching is not intended to be comprehensive, the researcher has reviewed relevant journals and conference proceedings and made numerous personal enquiries. Judging from the information collected it would seem that computers are presently under-utilised locally as a resource for language teaching and learning.

Chapter 5

Development of the *Write to Improve* software: Editing exercises for students.

5.1 Introduction

Although there are many existing software packages of a general nature which can be used in language instruction, there is a need for locally developed materials which will assist students in improving the quality of their academic writing. This need has been expressed by a number of language teachers involved in ADP's and can be related to the discussion in Chapter 3 about the constraints of ADPs and the potential of a computer assisted approach. In practical terms, because of the number of students requiring assistance and because of the persistent nature of their language problems, teachers are looking for alternative ways of addressing the problem.

Accordingly, the researcher has initiated a development project which aims to implement on the computer many of the exercises from *Write to Improve* (Murray and Johanson 1989). The software has been developed in a prototype form and a brief description is presented here.

5.1.1 What is *Write to Improve*?

The *Write to Improve* system is a suite of programs based on the book *Write to Improve* by Murray and Johanson. The programs implement a computer assisted environment for an aspect of language teaching and learning - that of error analysis.

The programs are content-free in that the language teacher may use them to set exercises for students. Typically, the teacher will enter a passage of text which has a number of deliberate errors of the kind often made by students. These errors can be documented according to their location in the text, their type, and a corrected form. The text, with its error documentation, is then used as a basis for an exercise in which the student tries to identify and correct errors.

The teacher's documentation can be used as a means of assessing the student's performance and also as a guide to the student. The purpose of the exercises is to raise the student's awareness of common errors in written language and to provide a systematic and efficient method of communication between teacher and student about errors in written work.

5.1.2 Intended Use

The system is suitable for a range of students from high school to university. The major potential users of the system are ESL students with a poor grounding in formal writing and English grammar. However it is possible that the system may be useful for EFL students as well, possible at a younger age.

The system should be used in the context of a more general language programme. Preferably, this programme should be based on the general methodology and materials used in the English for Academic Purposes series by Murray and Johanson. Strictly isolated use of the system may encourage an overly technical view of the process of writing in which correct grammatical form is stressed without paying sufficient attention to the process of writing.

5.2 System Requirements

The software can be used on any IBM compatible machine with an EGA or VGA screen. A mouse is required.

5.3 User Interface

5.3.1 The Mouse

A mouse is required for many operations in the programs. For those unfamiliar with the use of a mouse some guidance and practice may be necessary. A certain degree of dexterity with the mouse will facilitate smooth use of the programs.

The mouse is a pointing device used for choosing options which are presented on the screen. When the mouse is active a small arrow is displayed on the screen. As the mouse is moved the arrow moves. In this way the user can point at an option on the screen. This is usually a simple instruction or a key name (e.g. **Enter**). The buttons on the mouse can be pressed to select the option which is being pointed to. Sometimes the left and right mouse button have a different function. The exact function depends on the program in use.

5.3.2 Windows

The programs use the common method of overlaying displays. These displays are known as windows. A window is usually a rectangular area of colour superimposed on the main screen display. Windows are often used to present additional information (such as help) or a sub-menu. The window is 'closed' when it has served its function and the original display is restored. This prevents excessive replotting of screens which can disorient the user.

5.4 Main Menu

Figure 5 shows the main system menu. Options are chosen by moving the highlight bar up and down with the arrow keys and pressing Enter to select the highlighted option.

5.5 The Text Editor

The system includes a simple text editor which enables the teacher to enter a passage of text. The editor is similar in operation to common word processors at the simplest level of text entry and editing. However, the editor requires text to be entered one line at a time. Future development should make it possible to use an ordinary word processor to write the text.

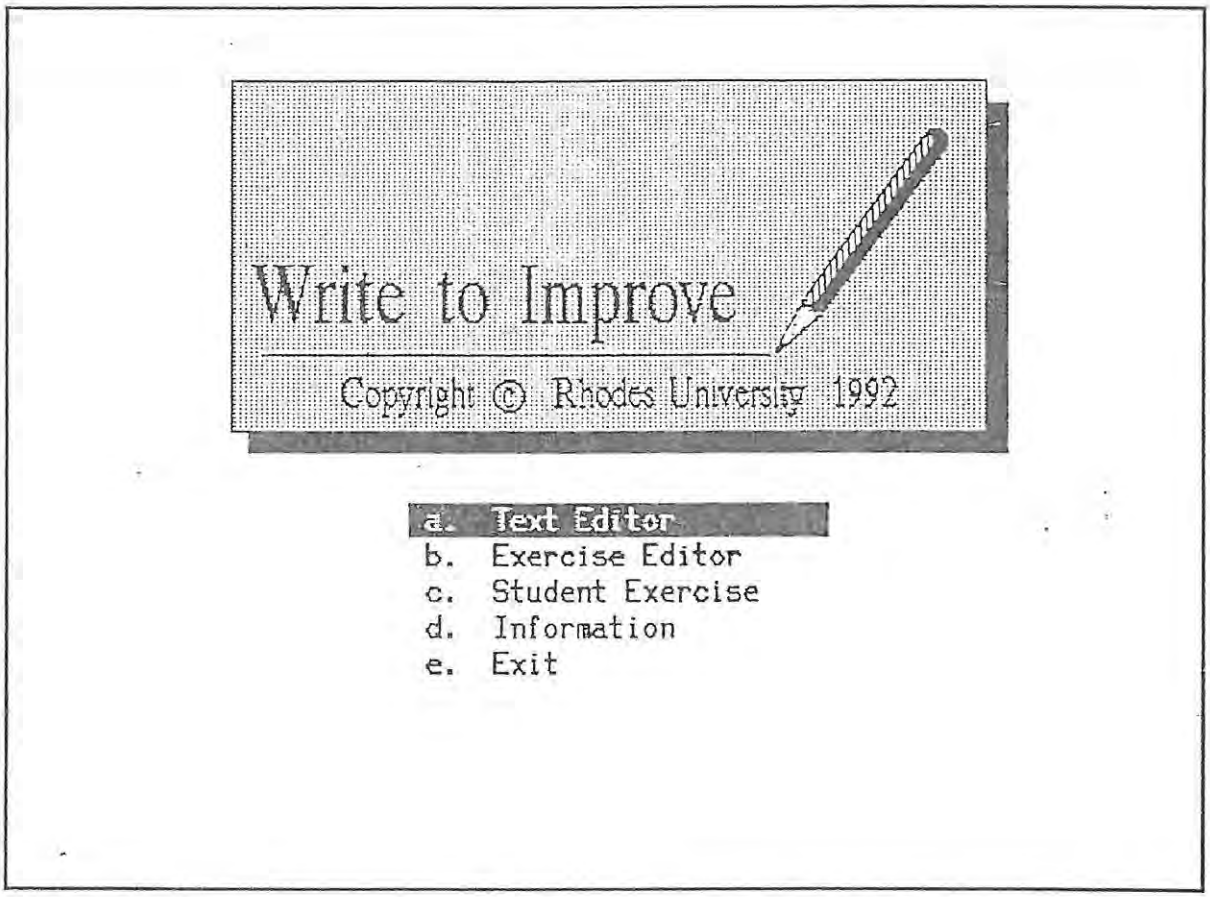


Figure 5: *Write to Improve* - Main Menu

5.5.1 File Options

Figure 6 shows the layout of the text processor. The options at the bottom of the display are selected by using the mouse. The File option is used to specify the file name, Save to save the current text to disk and Load to load previously entered text into the editor. Help displays information about cursor movement and basic editing functions.

5.5.2 Text File Format

A specific file format is used which reflects the line by line organisation of the file which is necessary for specification of errors in the Exercise Editor. Ordinary DOS text files are not

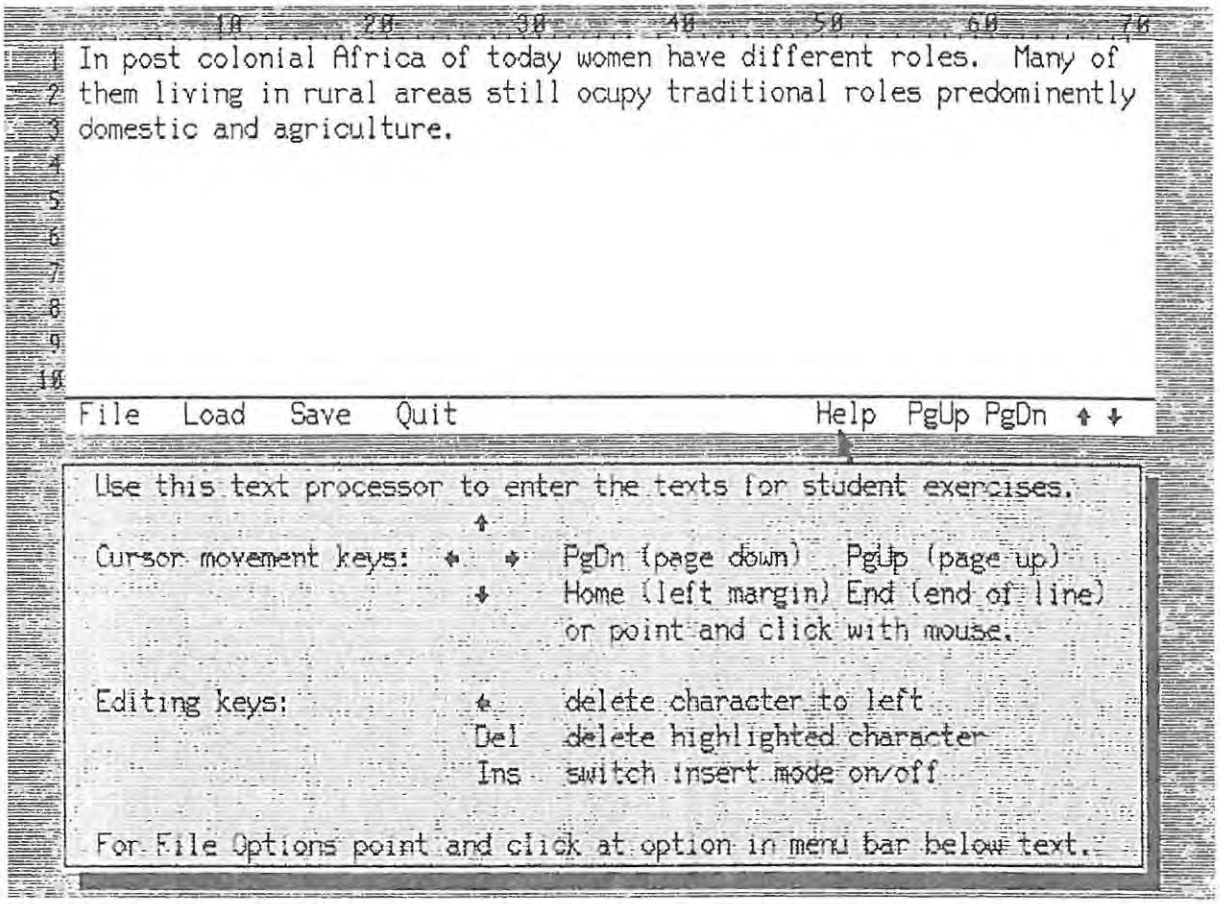


Figure 6: *Write to Improve* - The Text Editor

compatible with the format used. Files are TenCORE datasets and are saved with a .DAT extension. They can be processed by other editors and word processors if the text is required for purposes not related to the *Write to Improve* system.

5.5.3 Cursor Movement and Editing Functions

Basic movement around the document and editing are fairly standard and documented briefly in the Help.

5.6 The Exercise Editor

5.6.1 Introduction

The Exercise Editor is used by the teacher to document errors in the text. The general layout of the utility is shown in Figure 7. A passage of text is loaded into the text area. Errors in the text can be marked by highlighting a segment of the text (usually a word or phrase). The position of these segments is entered automatically in the Error Table (below the text area). Details of each segment (representing an error in the text) must be entered in the table. This process is documented in the following sections.

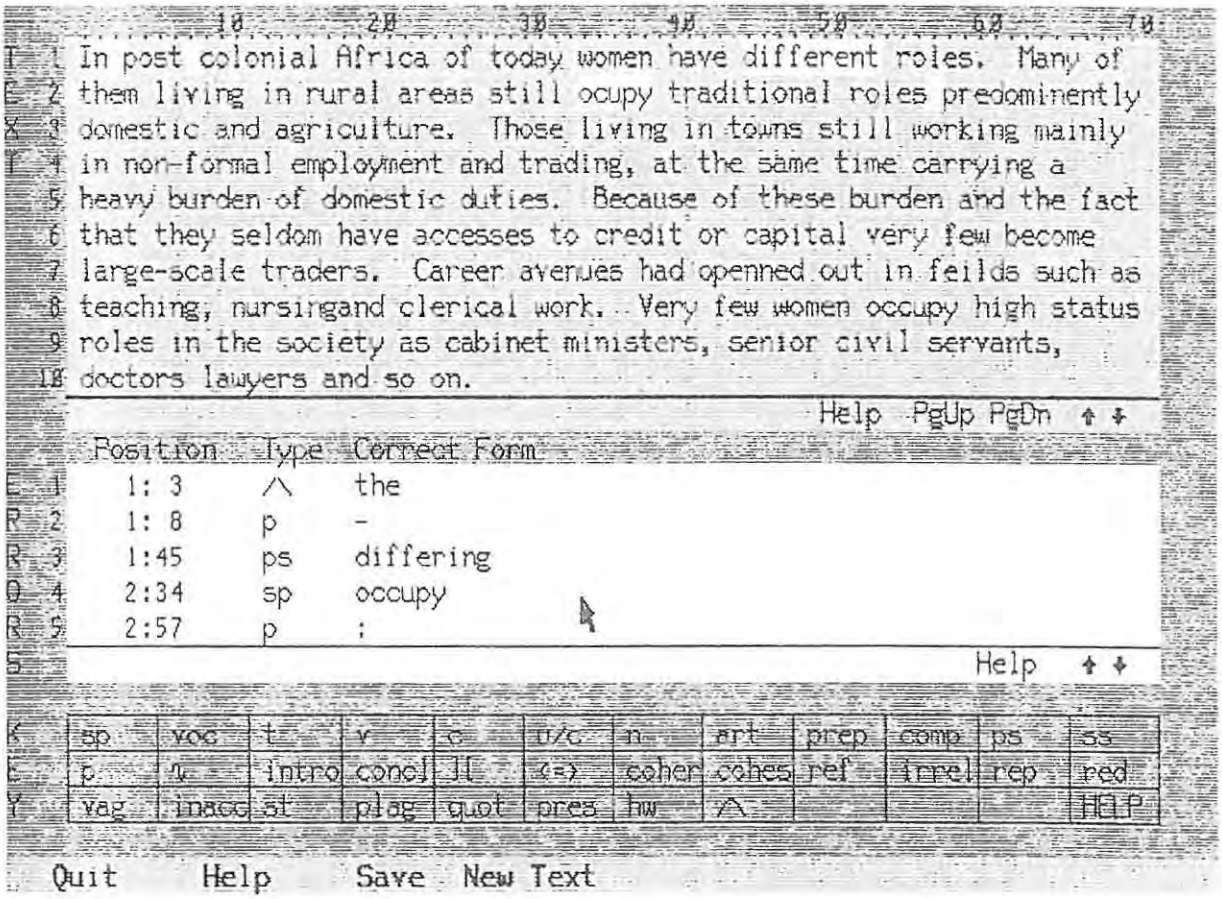


Figure 7: *Write to Improve* - The Exercise Editor

5.6.2 File Options

The options to load and save exercise files are at the bottom of the screen and can be selected by using the mouse. A passage of text entered using the Text Editor should be loaded. Errors are then documented by the teacher. When this has been completed the exercise is saved. This will copy the text and the error documentation to disk so that it can be used for student exercises. In this way the teacher can set up a number of files as a set of student exercises.

5.6.3 General Help

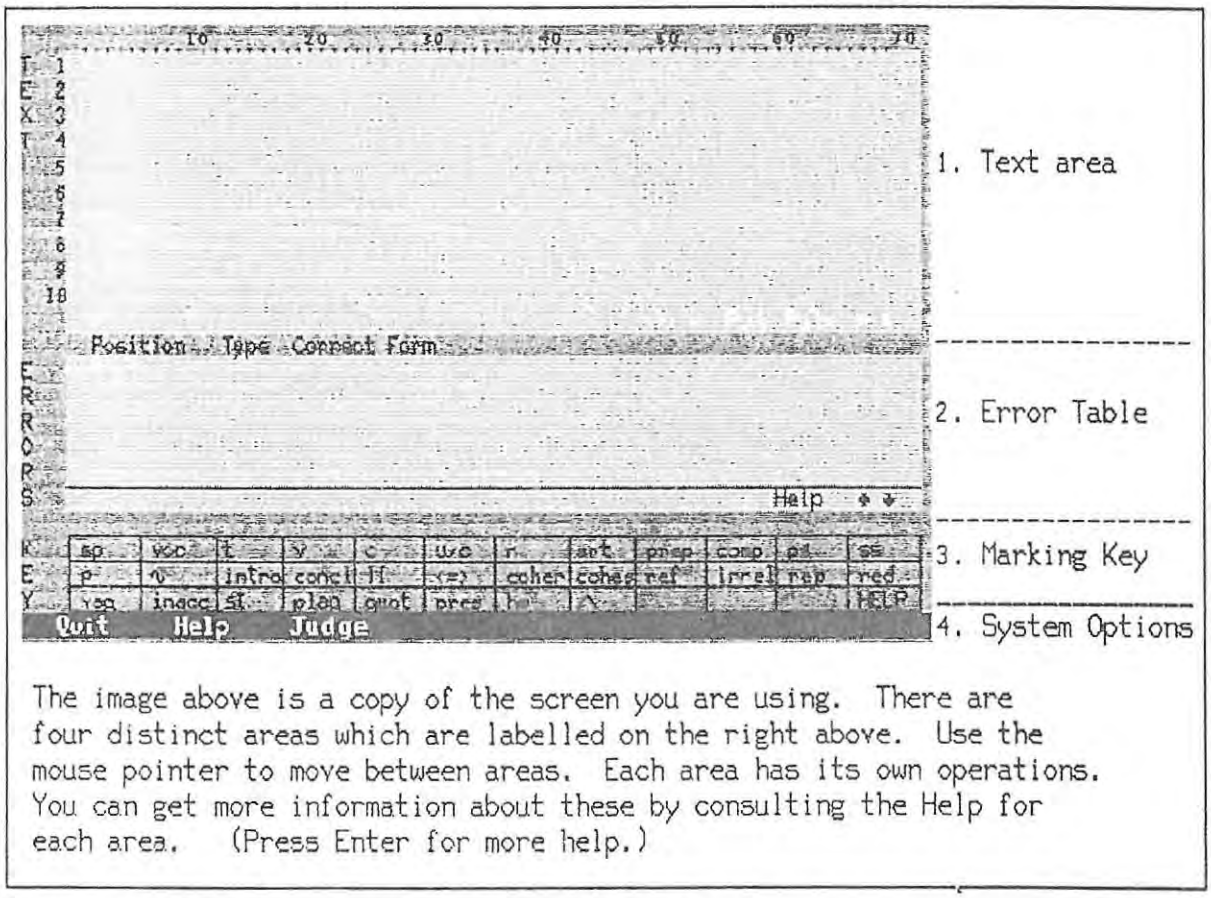


Figure 8: *Write to Improve*: The General Help System.

The Help option on the bottom line of the display can be consulted for general information on the screen layout and operation of the Exercise Editor. Figure 8 shows the general Help system.

5.6.4 Text Area

The text area allows the display of 10 lines of text at a time. The lines are numbered on the left of the text area. If the text is longer than 10 lines the scrolling and paging options (bottom right of the text area) can be used to display different sections of the text. The **Help** option provides help which is specific to the text area.

When the mouse pointer is moved into the text area a block-shaped cursor appears which can be moved about by using the mouse. A segment of text is marked by placing the block cursor on the first letter of the segment to be marked. The start of the segment is indicated by one click with the left mouse button. Then the pointer is moved to the last letter of the segment and the right mouse button is clicked to mark the end of segment. The segment will then be highlighted. The starting position of the segment is displayed in the Error Table below the text area. When a segment is marked the mouse pointer must be moved to the Error Table and the marked error documented. Then the pointer can be moved into the text area again for further marking.

5.6.5 Error Table

The Error Table stores the details of each error in three columns: Position; Type; and Correct Form

Position — This is given in the form line:column. e.g. 3:5 corresponds to a marked segment starting at line 3, column 5.

Type — This is the type of the error. Permissable error types are listed in the Marking Key below the error table.
Error Type is specified by moving the pointer into this column and clicking with the left mouse button. The pointer is then moved into the marking key area below the table. The error type required is select by pointing and clicking and the pointer is moved up to the table again.

Correct Form — This is the corrected form of the error. A correction is entered by moving the pointer into this column and clicking with the left button. A window is opened and a prompt for input shown.

Error entries are deleted by move the pointer to the appropriate line in the table and clicking with the right hand mouse button. A window is displayed in which the deletion is confirmed or cancelled.

The error table displays 5 errors at a time. The arrows below the table are used to scroll the display up or down as required. There is also a Help option on this line which explains the operation of the Error Table.

5.6.6 The Marking Key

The Marking Key is a grid of 32 symbols which represent different types of errors in language usage. These symbols follow Murray and Johanson's marking key very closely and it is recommended that the user study their book carefully.

When the pointer is moved into the marking key area, the symbol pointed at is highlighted. The symbol can be chosen for entry in the Error Table as described above. Alternatively, if the right hand mouse button is clicked, information about the error type is presented in a window. The information and examples are adapted from Murray and Johanson. Figure 9 shows an example of the further information available on specific error types in the marking key.

5.6.7 The Teacher's Task

The preceding sections have described the process whereby the teacher can annotate texts by specifying information about the errors which occur in the text. Annotated texts are saved and become available as student exercises in which the annotations are used as a guideline in judging the students' annotation of errors in the same text.

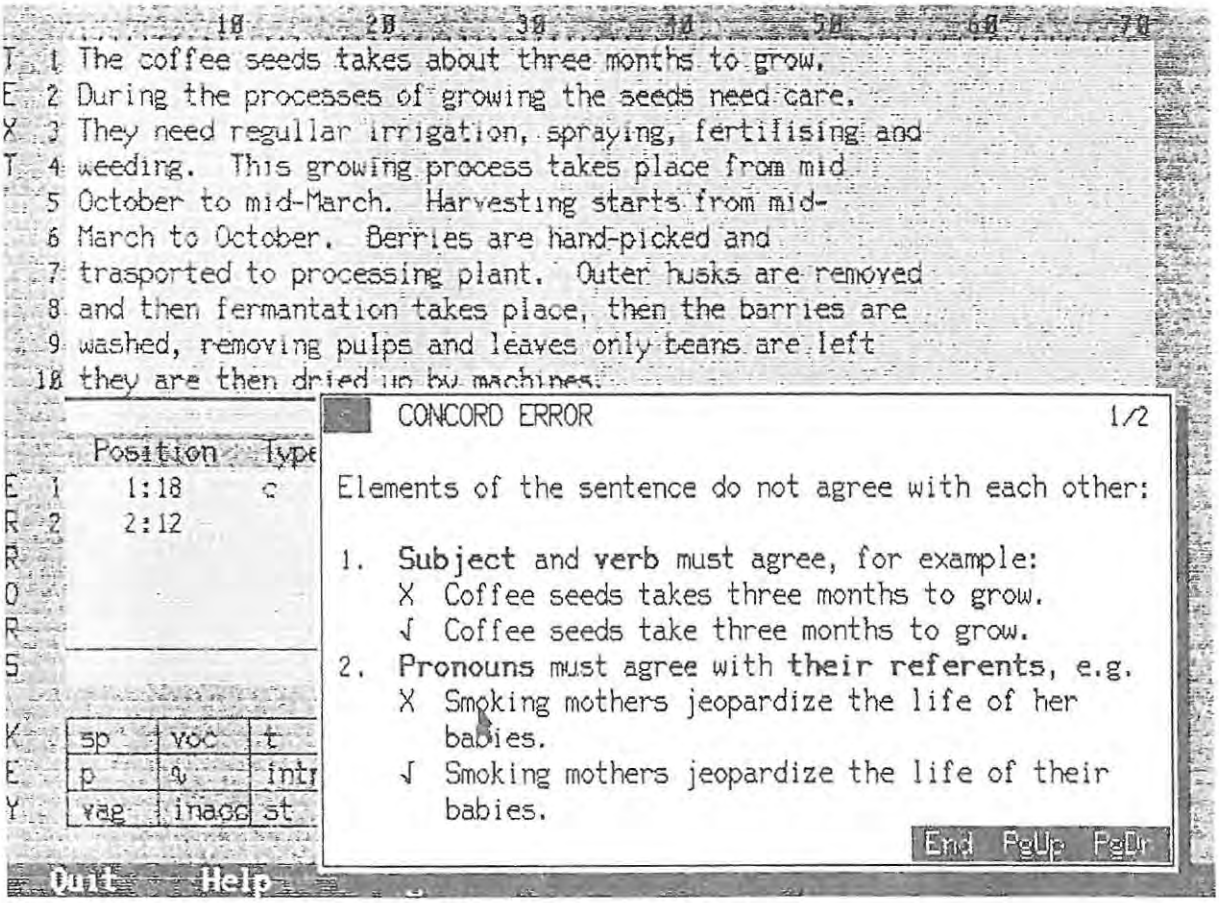


Figure 9: *Write to Improve*: Marking Key Information

5.7 Student Exercises

5.7.1 Introduction

When a passage of text has been entered and annotated by a teacher it can be used as the basis for a student exercise. The text is presented to the student in very much the same way as it is to the teacher. Figure 10 shows a typical student exercise. The student marks and documents errors in exactly the same way as described in the previous section. It is intended that the student should use the marking key extensively as an aid to learning about error types and correct usage.

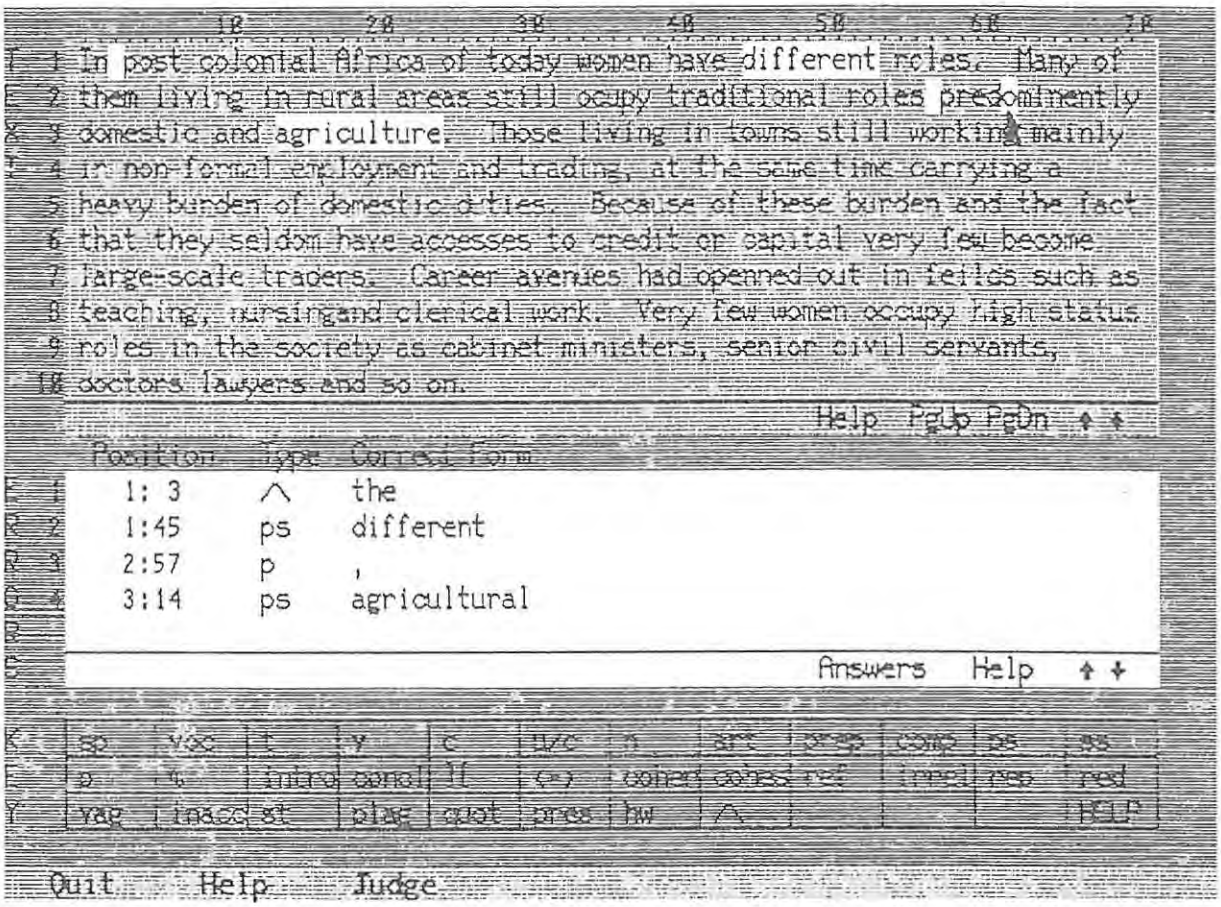


Figure 10: *Write to Improve* - A Student Exercise

5.7.2 Judging

At any stage during an exercise the student can select the **Judge** option (bottom of screen). This option compares the student's documentation of errors with the stored specifications of the teacher. The student's progress is judged in three categories:

Identification	number of errors identified correctly,
Classification	number of errors correctly classified,
Correction	number of satisfactory corrections made.

Figure 11 shows an example of feedback given to the student. There is also a system of colour coding used in the error table to indicate which entries have been judged as correct.

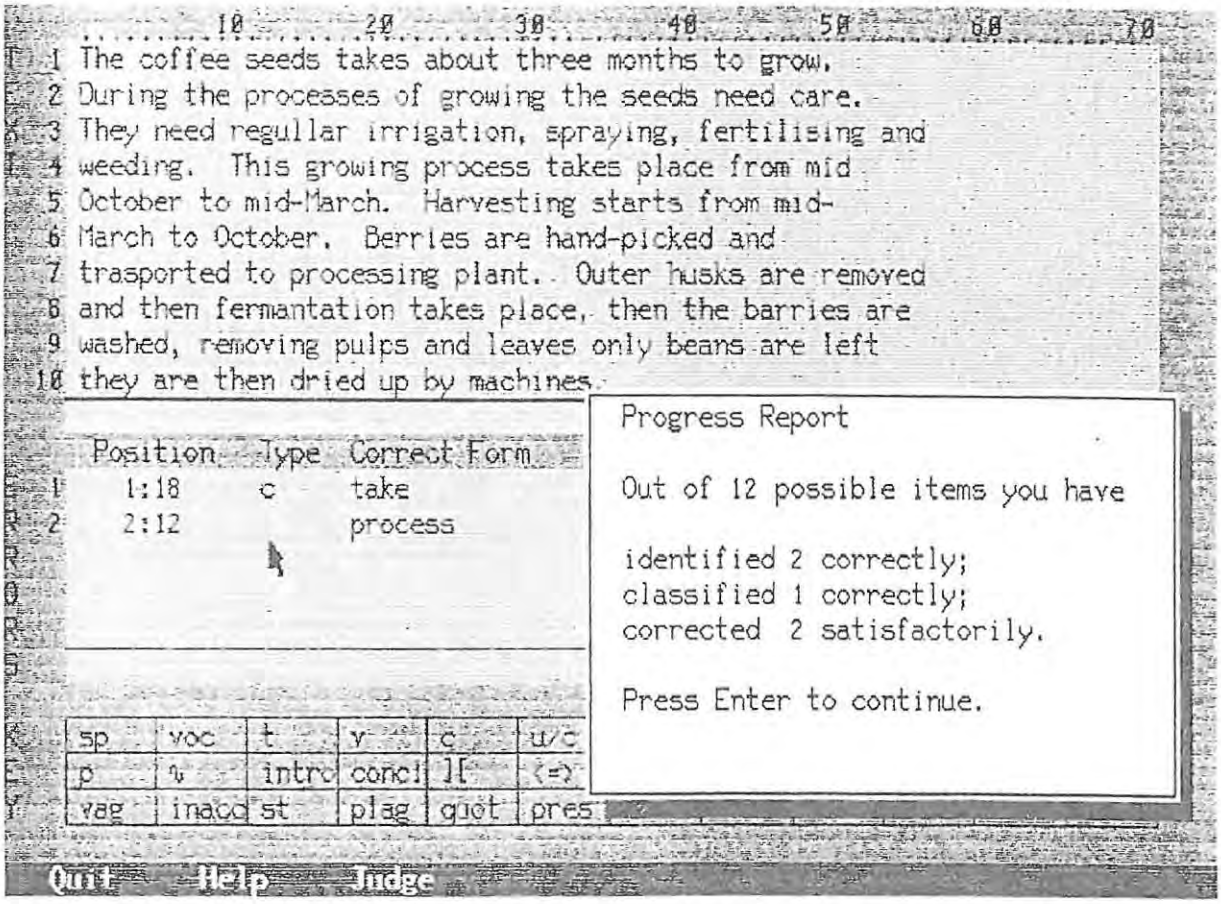


Figure 11: *Write to Improve* - Student Feedback

5.8 Necessary Improvements

A number of technical features of the package need improvement:

- Text marking does not span multiple lines;
- Highlighting of text only appears after the end marker has been placed;
- Better demarcation and highlighting of movement is required in the Error Table;
- The student's access to exercises needs to be managed; student performance data needs to be saved and reported. A system such as the CALnet system (Collett 1991) could be used for this.
- Major enhancements are needed for the information attached to the marking key. Independent tutorial lessons could also be made available.

Chapter 6

Evaluating the System

6.1 Evaluation Method

The evaluation of the program was consistent with the Action Research Methodology adopted for the project. Instead of a controlled test and evaluation of the program according to a pre-determined set of criteria for judging instructional software, emphasis was put rather on encouraging groups to discuss their perceptions of the program. These interactions form the basis of the evaluation of the program.

Responses to the program were gathered from three different small groups:

a. Post-graduate Education students;

b. University English language teachers;

c. Undergraduate students.

Further detail about group composition and procedures followed is contained in the separate sections below.

6.2 Pilot Seminar

The researcher organised a seminar with a group of four post-graduate Education (ESL Masters) students during which the program was demonstrated and discussed. The seminar was organised to gather preliminary data about perceptions of the program so that the researcher could judge generally whether language teachers thought that such a program had potential. A further aim was to refine the researcher's understanding of the needs of language teachers in this area. Because this was a pilot seminar no attempt was made by the researcher to structure the interaction and the session was not recorded directly on tape or in writing.

The general impression gained from the seminar was that there was a great deal of interest in this sort of program and that language teachers would welcome this sort of support provided that it

could be shown to work effectively. No major objections were voiced to the basic methodology used and language teaching assumptions made although participants were asked explicitly to comment on these aspects. Participants felt that the program presentation and user interface could be simplified and improved.

6.3 Teacher Responses

Two seminars, each lasting approximately two hours, were held with a group of university English language teachers, from three different universities in the Eastern Cape. The first seminar was attended by six teachers, the researcher, and a colleague with a broad interest in CAL. The second seminar was attended by five language teachers and the researcher. The term language teacher is used as a convenient general term for participants who have language teaching qualifications and experience. The seminars were intended as an opportunity for participants to evaluate the software, and to discuss other possibilities which the use of computers affords the language teacher. The seminars could be described as unstructured group interviews, with the researcher acting as the interviewer or facilitator.

6.3.1 A description of the method

Before the first seminar participants were sent a user manual and other information about the program. At the first seminar the program was demonstrated to the group by the researcher. The intended use of the program was explained and the researcher did part of an editing exercise to show the operation of the program. The remaining part of the seminar consisted of a group discussion. At times the researcher demonstrated further details of the program. The program *Correct Grammar* was also demonstrated briefly during the second part of the seminar. The seminar was recorded on audio tape. The recording was transcribed and circulated to participants.

In the second seminar participants were asked to confirm the themes that the researcher had identified from the transcript of the first seminar and to make recommendations for further development. The second seminar was also recorded on audio tape, transcribed and analyzed.

After the seminars the author did an analysis of the data based on the method described shown in the table below.

1.	Transcription
2.	Bracketing and phenomenological reduction
3.	Listening to the interview for a sense of the whole
4.	Delineating units of general meaning
5.	Delineating units of meaning relevant to the research question
6.	Training independent judges to verify the units of relevant meaning
7.	Eliminating redundancies
8.	Clustering units of relevant meaning
9.	Determining themes from clusters of meaning
10.	Writing a summary of each individual interview
11.	Return to the participant with the summary and themes: conducting a second interview
12.	Modifying themes and summary
13.	Identify general and unique themes for all the interviews
14.	Contextualise the themes
15.	Composite summary

Figure 12: Phonomenological Analysis of Interview Data (Cohen and Manion 1989:329)

The steps in this procedure have been followed closely in this research. The process of delineating units of meaning, eliminating redundancies, clustering meanings, determining themes and summarising was achieved by selecting key words and phrases from the transcript and grouping these under a descriptive term. Two passes using this method were carried out. Appendix A shows a sample of the transcript, a list of key words which identify clusters of meaning, and a list of general themes.

On analysis it seemed that no clearly new themes arose from the second seminar so for the purposes of this research the transcripts of both seminars were then treated as one.

6.3.2 Themes emerging from teacher seminars

The following themes were identified by doing an analysis of the transcripts:

- Language Teaching Theory and Practice
- Program purpose
- Program features
- Learner characteristics
- Teacher needs
- Research
- Writing development
- Reading development
- Curriculum Context
- Related Programs
- Further development

These themes are discussed in the sections which follow.

6.3.2.1 Language Teaching Theory and Practice

Understandably, a central theme emerging from the group discussions was language teaching theory. Teachers consistently tried to relate their response to the programs to a theoretical perspective. Areas of theory frequently referred to were: Error analysis, consciousness raising and monitoring; interlanguage and rule systems; the place of grammar instruction.

The majority of the participants subscribed to a theoretical view of learner errors as being functionally important in the learner's development of a system of rules for language use. According to this view it is not desirable to treat errors as faults to be corrected mechanically, especially during earlier stages of language production, both in terms of the individual's development and in terms of the development of a piece of writing. There is a concern that early emphasis on error counters fluency. A more useful approach is thought to be to develop students' ability and readiness to monitor their language use according to their formal knowledge

of grammatical rules. The concept of interlanguage (the emerging language system of the second language learner) was referred to a number of times, particularly with respect to the possibility of a diagnostic use of the programs. Grammar instruction was seen to be useful only if students are ready for it and it can be related to their own needs.

In general it was clear that participants were consciously applying their understanding of theories, such as those of Krashen, and Cummins and Swain, in their responses to the programs. Further discussion of language teaching trends is contained in sections 3.2.1 and 3.2.2 of this study.

6.3.2.2 Program purpose and value

It was interesting to note that participants were relatively optimistic in their assessment of the purpose and value of the programs in that they proposed a number of potential uses in addition to the explicitly planned use. The most important use of the programs was recognised as being the teaching of proof reading and editing. The system was also seen as being useful in training students and lecturers to use a writing feedback system. This is also an explicitly planned use as the marking key is a central part of the *Write to Improve* exercises. In addition the system was considered as potentially useful for research purposes as illustrated in the following extracts from the transcript:

> "It seems to me that one of the most useful ways in which a teacher can use this is in getting insight into what errors the students are able to correct and which they cannot, because you then get a sense of where they are in terms of the rule systems they are using."

> "You are working in a program like this on generalisations about students' language so the more accurate those generalisations are the better."

The participant suggested that the system could be used to monitor the extent to which students are able to identify different types of errors. Judgements about the students rule systems and other generalisations about their knowledge of the language could then be made more reliably. Regarding language acquisition:

"... there is actually a role for this in terms of language acquisition because people are seeing more of a role for formal instruction in language acquisition, not simply in teaching rules but very much in this area of intervening in students' interlanguage. Actually this might have greater value than I may have perceived at that time. I saw it as something fairly peripheral which happens at the end of writing whereas now I think that there is a role for it more centrally in developing student's linguistic competence."

The point being made here is that texts can be selected or devised which contain errors which are typical of the imperfect, developing system of language rules of the second language learner (see Selinker in Richards 1974). An exposure to these errors or approximations may assist the student to acquire correct rules.

6.3.2.3 System features

The transcript of the discussions reveals frequent assessment of methodological, technical and surface features of the system.

Participants were generally unfamiliar with the CAL field. On the one hand this enabled them to see the system objectively, for what it was on the screen. On the other hand they lacked a frame of reference for relating the system to other types of programs or systems. To the author the distinction made in CAL discourse between **content-fixed** and **content-free** programs, especially in the context of Taylor's (1980) taxonomy (tool, tutor, tutee) is useful for describing this system. It is essentially a content-free tutorial type system. Participants were less clear about these types and were inclined to see the system as being able to double as a tutor and as a tool - a word processor which can tutor.

This is an interesting perception because this is precisely what grammar checking systems are supposed to be. The possibilities for using these kinds of programs will be discussed in the following chapter. It is clear that participants tended to see the program from a methodological point of view whereas the author's involvement in development and more extensive experience in the CAL field led to a somewhat more technical view of the system.

From the point of view of the research methodological basis of this entire study the foregoing discussion is interesting. It can be argued that the action research methodology, as discussed in chapter 3, has been effective in enabling a multifaceted assessment of the system. This is so because of the collaborative, participatory and self-evaluative nature of the methodology. Practically it meant that the diversity of experience and perspectives of the participants prevented a narrow evaluation of the system (cf. discussion on triangulation in Section 6.4.3). Had the system been developed from the source material and then tested with students, the richness of teacher experience would have been missed and it is probable that a bland or inconclusive quantitative evaluation of students' responses to the system would have resulted.

6.3.2.4 Configurability of the system

The system can be used by teachers to enter texts of their choice and annotate these. Participants saw the potential of the system for setting up a series of graded editing exercises which would be appropriate to students' improving proficiency. The need for graded exercises led to discussion about the degree of feedback which is desirable for students at different stages. A human teacher has great flexibility in adapting to the needs of the learner and creating an environment in which the student is challenged but not overwhelmed. (This is related to Krashen's concept of marginally comprehensible input.)

It would be desirable to build in as much flexibility as possible into the way the system responds to the student, apart from the content-free nature of the system. It was suggested that there were various options for configuring the system. These include:

- Options for the teacher to set the number of items in the marking key so that for example students at a lower level would not be confronted with the full array of error markers when the intention of the current exercise is to proof-read for a basic class of error.

- Options for specifying the level of help provided for the student. This could vary from very little to a comprehensive help system which extends to providing exercises for the

student where necessary. An advantage of such a system is that the student's use of the system could be tracked by the system so that a simple model of the student could be built up. For example, the depth and frequency of the student's exploration of the help system and performance on exercises could be taken as an indication of problem areas for the student. This assumption is clearly tenuous but may be useful in making the program more adaptable to the student and in indicating areas in which students typically seek help.

6.3.2.5 User interface

The user interface was discussed. Some participants felt that using the system required a degree of familiarity with software conventions and the use of the mouse which students of the type for whom the system is intended typically may not have. Generally students would need to be quite dexterous with the mouse, and to understand the use of programs which employ a layered (windows-like) presentation. Because of this some participants suggested that the program should be as similar to the pen and paper mode as possible. The researcher is of the opinion that these judgements can only be reliably made after observing student use of the program. Further comment is made in Section 6.4 which deals with student responses to the system.

6.3.2.6 Screen presentation

Screen presentation was considered somewhat crowded but the general visual effect was considered pleasing. It seems to the researcher that a compromise was necessary in this area. The simplest design for this sort of content-free editing tutor might be a screen which allows the user to mark words, phrases or sentences and comment on these in a relatively free format (using the marking key if necessary), possibly on blank lines if the text is double spaced, or in a margin provided for this purpose. The simpler format would be more difficult to implement technically and in the absence of empirical data about student use of such a system it was felt that the relatively more complex presentation with three different areas of the screen should be retained.

Furthermore the researcher had limited time in which to experiment with different display formats.

This discussion clearly indicates a dilemma faced constantly by developers of instructional software. Often the pedagogically most desirable design also requires the most development resources. The result is that a compromise is usually struck so that a system evolves which satisfies the minimum user requirements but is not too expensive of resources. The judgements involved in making this compromise are often difficult and tend to be made intuitively. This may well account for users' experience that most software systems are unsatisfactory in a number of minor but not catastrophic aspects. The use of a Quality Review Checklist (Alessi and Trollip 1989:482) can assist in maintaining a satisfactory quality. The review posses many questions about the surface features of instructional programs which are relevant to the discussion in Sections 6.3.2.3 to 6.3.2.7.

6.3.2.7 Supporting media

The system would benefit from a simple user manual which could be used as an alternative to the on-screen help system. For teaching purposes it would be necessary for teachers to produce backup reference material on paper for students. This would probably be the case in any event since the system is content-free and would be used in conjunction with a language course with its own texts, for example the EAP series, or a specifically designed workbook.

6.3.2.8 Quality of grammatical explanations

A point which was made repeatedly in the discussions was that the quality and appropriateness of grammatical instructions are vitally important. For example, the student who is able to identify an error but not classify it would be hindered by an overly technical linguistic explanation but helped greatly by an explanation which perhaps pointed out the difference between the English and mother-tongue usage. The student of language on the other hand would require the former explanation.

6.3.2.9 Learner characteristics

Because of their teaching experience with second language students in a range of different institutions, the participants were acutely aware of probable learner characteristics and variations.

Quite obviously, students who lack computer literacy and a knowledge of what software typically looks like and how it works, may be intimidated or confused by the experience of trying to use the system. A system designed to assist in overcoming language disadvantage should avoid introducing another source of disadvantage. This criticism is one which is often expressed about computers in education in the South African context. Kirby et al. (1990), writing about American schools, warn against computers introducing disadvantage because of the limited access to computers in poorer schools.

The researcher is of the opinion that computers are powerful tools in an academic environment. If an institution has the resources to make them available for CAL then it has a duty to provide training and support for students who may be disadvantaged by lack of prior experience. It does not seem progressive to avoid their use. In addition there is evidence to suggest that students pick up enough skill to use CAL programs relatively quickly. Experience with CAL at Rhodes University has shown this for a number of student groups: participants in a computer literacy class who as a rule had no previous exposure to computers were able to use the computer for simple word processing, including printing on a network, after three hour-long sessions; similar students used the PLATO system in a first session with no apparent problems at the user level (Booth 1993:24).

The preceding discussion relates to a more general educational phenomenon: that of learner variation. While an experienced human teacher interacting with individuals or small groups is perhaps ideal, larger groups with a teacher may miss out on individual attention. Proponents of CAL have often argued that one of its strengths is the ability to individualise instruction (Alessi and Trollip:1991:13).

The motivation of students was discussed. Grammar instruction for its own sake is seldom popular. Even though students may recognise that they need to learn more about grammar, they often lack the motivation to learn. Participants felt that if grammar instruction could be done in the context of editing exercises, particularly with authentic texts, the possibility of maintaining motivation would be higher. These views were based on participants real classroom experiences. Two participants reported extremely successful grammar instruction classes which had arisen from editing and discussion of student writing. There is something of the same rationale here that Johns (1993) uses for his data driven learning in which the student acts as researcher.

6.3.2.10 Teacher needs

Teachers working in the field of language development often have many students who need intensive support. Teachers in this position themselves need support because they are often over-committed. Language development programmes in ADPs run the risk of lack of continuity and consolidation because of this. Computer assisted programs may be extremely useful in extending teachers' capacity to teach.

It was recognised that a content-free system like the *Write to Improve* system requires the development of suitable exercises. Exercises can be tailored to the needs of specific student groups. Inexperienced teachers may need training in developing suitable exercises.

6.3.2.11 Writing development

Participants clearly recognised that much editing practice can be done using a simple word processor. This would have the advantage that students would be editing the most authentic text - their own. However, this relies on the availability of a teacher to respond to drafts and discuss with the student how his writing may be improved. It was recognised that this is most desirable and that the computer medium could facilitate this process greatly. Sections 4.2.5 and 8.6 contain more thorough discussions of using word processing in this way.

6.3.2.12 Reading development

Editing exercises are additional opportunities for careful, critical reading. Quite clearly the development of reading skills would be an important focus.

6.3.2.13 Curriculum Context

Participants discussed contexts in which the system could be used. The role of other subject teachers in teaching language across the curriculum was explored. It was felt that the content-free design of the system would enable the system to be used in different curricula. Exercises based on texts from different genres would raise student awareness about the nature of different types of discourse.

Academic development programmes strive to improve students' learning strategies at all levels, meta-cognitive, cognitive, social-affective (cf. CALLA system of Chamot and O'Malley, 1987). There is a need to introduce the development of these strategies into curricula and move away from content-dominated curricula. Editing, and intimately linked with this, the development of critical reading, are important skills in this regard.

6.3.2.14 Related Programs

The relationship between the *Write to Improve* system and word processing and grammar checkers was discussed. Participants saw the concept of a grammar checking program as a natural and potentially useful further development of tutorial programs which aimed to improve editing skills. The obvious advantage of grammar checkers would be that students could check their own writing interactively. A grammar checker, *Correct Grammar*, was demonstrated to the group. It was felt that such programs may be useful in improving students' consciousness of grammar but that the lack of accuracy and consistency and the poor quality of the feedback of the program, as judged from the demonstration made it totally inadequate for teaching purposes. Grammar checking programs are discussed in more detail in the Chapter 7.

6.3.2.15 Further development

It was felt that the further development of the system should be informed by further research into learner needs, possibly by a system of this kind gathering data on student ability to respond to errors. The need to integrate the system's use into a broader language programme was strongly recommended.

To conclude, the group discussions played a vital part in developing the researcher's understanding of teachers' needs and views with respect to computer assisted language learning systems. The discussions clearly illustrated the complex nature of teacher-learner-subject interactions in the field of language learning and the need to consider this complexity very carefully in the design of instructional computer systems. The involvement of experienced language teachers allowed for a highly meaningful consideration of design issues. The use of the Action Research methodology was significant in facilitating this involvement.

6.4 Student Responses

6.4.1 Student Characteristics

The researcher worked with a group of six students who had volunteered to use the system. Of the students, one attended only one session and the remainder attended two. The sessions were approximately one hour long. English was the first language of three students and the second language of the remaining three. All except one student were in their first year of study. Students varied widely in their level of computer literacy, ranging from one student who had not used a computer, to another who had only played games on a computer, to some who had used a word processor for doing assignments.

6.4.2 Tasks

During the first session the system was introduced to the students and a simple exercise from *Write to Improve* was presented as practice to familiarise them with the operation of the system.

Each student was given a printed copy of the Marking Key and various extracts from *Write to Improve*. Students were asked to study the Marking Key and the extracts at home in preparation for the second session. In the second session the students were given a more realistic proof-reading and editing exercise, adapted from a passage in *Write to Improve*. The text of the exercise is given in Section 6.4.4.

6.4.3 Observation Method

The researcher introduced the tasks to be done and was then available in a support capacity. This enabled natural observation of the students as they used the system. A disadvantage of this method was that observation tended to be selective. When the researcher was involved with assisting one student other students could not be observed. As another source of data students made notes on any difficulties they experienced. These were collected after sessions. On the basis of observations the researcher selected two students who had seemed most engaged with the exercises and conducted a personal interview with them. This use of different methods of observation and data collection enabled the researcher get a more complete impression of the students' experience. The method is referred to as methodological triangulation (Cohen and Manion 1989:269) and is illustrated well by Smith and Keep (1988).

6.4.4 Observations and Analysis

The students with limited exposure to computers took most of the time in the first session to learn how to use the mouse and understand the operation of the program. From this it became clear that should the system be implemented as part of a formal course, initial familiarisation and training would be necessary. Although graphic user interfaces and the use of a pointing device are becoming quite common-place in computing, an option to use the program without the mouse may be necessary to cater for students who have difficulties. Interestingly, one student who had such difficulties saw the exercise as an opportunity to learn to use the mouse (recognising that this would be a useful computer skill in future) rather than being discouraged. However it is quite likely that other students in this position could be discouraged.

From a technical point of view the trial of the system was useful in showing up a number of minor problems of operation. For most of these improvements have been made subsequently. The changes made were generally to improve the ease of use of the system and do not warrant detailed discussion. However, this trial confirmed the researcher's conviction about the necessity of thorough trials of systems in development with real students doing real learning tasks.

The first exercise was relatively trivial from a language point of view. Students had few problems identifying and correcting errors. Even so they were engaged in the task of learning to proof-read and using a formal taxonomy of errors. It is likely that there was a great deal monitoring of their own grammatical knowledge, although detailed observations are not available to confirm this.

For the second session the students were more familiar with the system and concentrated more on the proof-reading exercise. The text for the exercise was the following:

> "In post colonial Africa of Today women have different roles. Many of them living in rural areas still occupy traditional roles predominantly domestic and agriculture. Those living in towns still working mainly in non-formal employment and trading, at the same time carrying a heavy burden of domestic duties. Because of these burden and the fact that they seldom had accesses to credit or capital very few become large-scale traders. Career avenues had opened out in fields such as teaching, nursing and clerical work. Very few women occupy high status roles in the society as cabinet ministers, senior civil servants, doctors lawyers and so on." (Adapted from Murray and Johanson 1989:11)

None of the students was able to identify and correct all the errors. One first language student identified all but two of the errors but was unsure how to correct some errors, including the structural problem in the second (non-)sentence. The student commented "I wanted to change the sentence structure somehow." This student was the most engaged in the task, spending additional time after the session trying to complete the task. One second language student was unable to identify many of the errors. These two students were

observed as the most and least competent of the group at doing the task. Since they also seemed to the most engaged in the task they were natural candidates for personal interviews.

Interviews with individual students

The first language student judged the exercise as being extremely useful and felt that more exercises of this type would be highly beneficial. During the interview it emerged that the student had experienced great difficulty in writing first year English assignments. The student's perception was that the problem was grammatical because her writing was corrected by tutors rather than being commented upon. Subsequently the researcher and the student examined of one of the student's assignments. It was quite clear that the problems were not essentially grammatical. The student was confused about the style 'required' for this kind of assignment and tended to over-elaborate. Feedback from the tutor tended to increase rather than decrease this tendency. The student lacked the confidence to express thoughts in simpler language and consequently became confused about the thoughts.
This student did not need remedial grammatical work, although her grammatical knowledge could have been improved. More extensive proof-reading and editing exercises could have been used to build the student's confidence in her knowledge of the language and enabled her to concentrate more on the stylistic difficulties she was having with assignments.

The second language student felt that he did not have significant problems with English grammar but that he did not know how to write assignments. Even though the student clearly did not have an adequate knowledge of the language this self-assessment was probably more accurate than that of the previous student as described above. The student needed help in developing his writing skills and clearly perceived this as the first priority. This confirms the teachers' views on the place of editing and treatment of errors. It is likely that this student would have benefited from further editing exercises and development of grammatical knowledge only after he had developed more confidence in his general writing skills.

In the case of both students it was quite clear that although there is a need for editing practice it should be integrated within a more general language programme (and if possible into regular course work), which pays attention to the students' needs for reading and writing

development. It seems to the author that the Writing Centre concept (Paxton 1992) is important in this regard (see Section 4.3).

6.5 Further Reflection on the Research Method

This chapter has described responses to the system by small groups of teachers and students. The action research methodology has proved extremely productive in facilitating a qualitative evaluation of the system. It has been possible to explore the needs and views of both teachers and students at a level which would not have been possible with a quantitative approach. This exploration at the initial stages of designing instructional software can be crucially important to the success of the development. Alessi and Trollip (1991:chapter 7) confirm the importance of this exploratory stage. They advocate a ten stage development procedure as shown below.

1. Determine needs and goals
2. Collect resources
3. Learn the content
4. Generate ideas
5. Design instruction
6. Flowchart the lesson
7. Storyboard displays on paper
8. Program the lesson
9. Produce supporting materials
10. Evaluate and revise

Although the researcher is thoroughly conversant with this development model, having used it in instructional software development projects in the Computer Based Education Group at Rhodes University, the current study calls the model into question. What has been done is more in the line of a prototyping exercise which has been used extensively to test responses of teachers and students to a proposed system in a qualitative way. Alessi and Trollip's model relies on the insight and skill of the developer in determining needs and goals from the point of view of learning objectives. In practice many developers do not pay enough

attention to this step, or their formulations are inadequate, typically not taking careful account of practitioners experience and student needs. The result is often systems that neither teachers nor students like to use. Alessi and Trollip's model can accommodate the need for prototyping and subsequent detailed consultation with teachers and students if one sees the model as being cyclical. In this way the model is used to produce a prototype. The prototype is then used in the first stage of the second development cycle. This has the potential for making the determination of needs and goals a more realistic exercise. Developing instructional software is clearly not an exact science.

The need for cycles of development discussed above makes the use of the Action Research methodology highly appropriate since the method is also cyclical in nature. The sessions with the teachers and students informed a number of technical changes in the software designed to improve ease of use. The further development of the software will be substantially affected by the responses of participants to the user interface in particular. This needs further simplification and refinement. However the cycle of diagnostic and therapeutic stages implicit in the action research methodology are more significant in this study in clarifying the place of editing exercises in the context of more general language development programme.

Chapter 7

Generic Editing Tools

7.1 Grammar and Style Checkers

A weakness of the *Write to Improve* software is that although it provides structured editing practice for students based on typical student writing, the text that students practise editing is not their own writing. This is bound to make the exercises less "dynamic, context-sensitive and .. responsive" (Bolt 1993:140).

An awareness of this weakness prompted investigation into a range of computer programs which attempt to check grammar and style. In the same way as spelling checkers assist the writer to identify spelling errors, these programs can be used to check the writer's grammar and style. If such a program could do this effectively it would clearly be an important means of improving writing. The finished product would be improved and it is probable that consistent use of a checker would also improve the ability to write grammatically. This claim is made speculatively on the grounds that the writer would be sensitised to areas of weakness or error which the writer would learn to improve through practice.

This chapter considers reviews of grammar checking programs in order to judge their suitability as a writing tool for second language students. The reviews by other authors are supplemented by the author's own research.

7.2 Reviews of Grammar Checkers

Bolt (in Yazdani 1993:141) describes the class of programs under consideration as follows:

> "Most grammar and style checkers consist of a large dictionary of words and some way of setting these words into patterns that represent a structure for each sentence - a parsing process - and a way of presenting either the structure itself, or observations based thereon, to the user with appropriate comments."

The dictionary is typically a large, on-line lexicon which classifies each word according to parts of speech and morphological, syntactic, collocational and idiomatic features. The lexicon is usually quite comprehensive. For example *Correct Grammar's* 'Master Lexicon' contains 135,000 word patterns.

The parsing process attempts to analyze the grammatical functions of words in a sentence, or fragment, and to represent the sentence structure in terms of these functions. The structure is then checked for correctness. Structures which are identified by the system's grammatical rules can be compared to known error patterns.

Feedback is provided to the user according to the information gathered or inferred by the system during the parsing process. This feedback is usually in the form of suggested errors and possible corrections or a suggested method of correction. Some systems can provide this feedback interactively so that the user can step through the text considering each suggested error and editing where necessary. Other systems require the processing of a whole text in batch mode. The resulting output is typically the text with comments about errors embedded in the text. The user then uses a printed copy for reference when editing the text.

Applications naturally differ in their methodology and practical functioning. For example, Correct Grammar uses four 'expert' modules which are used together to do the analysis and feedback. These are: the Sentence Expert, Dictionary Expert, Parsing Expert, and Parse Analysis Expert.

Bolt tested the performance of the seven grammar checking programs listed below:

Correct Grammar; Right-Writer; Grammatik; Reader; Power Edit; CorrecText; LINGER.

A number of erroneous sentences were used as input data and the performance of the programs was noted. Errors in the input data represented the following error categories:

- Indefinite articles - 'a' versus 'an'
- Determiners - 'this' versus 'these'
- Determiners and quantifiers with countable and uncountable nouns

- Subject/verb and subject/auxiliary agreement with simple subjects, including main verb forms
- Subject/verb agreement with coordinated subjects
- Subject/verb agreement with subjects having post noun phrase and relative clause modification
- Possessive forms
- Pronouns in object positions
- Pronouns in embedded clauses
- Modal auxiliaries and main verbs
- Adjectival and verb complementation

(Bolt 1993:148)

Bolt (1993:170) suggests the following criteria for the assessment of programs: "accuracy of error detection, value of suggestion or repair strategy, range of language and problems covered, speed of operation, and general ease of use." His general conclusion is that all of the programs which were tested performed poorly although "words and word patterns that were characterised by more easily identifiable morphosyntactic features and relative closeness of related words and general size of word patterns, fare better, for example, close subject-verb or article/determiner-noun patterns." (Bolt 1993:171)

The programs are further categorised as transparent, semi-transparent, semi-opaque, and opaque systems. A transparent system would be one in which the resources (lexicon) and methods (grammatical rules) would be open to inspection and manipulation by the user. For example, the lexicon would be able to be extended or particular items or information about items changed, parse rules changed, and the resulting parse trees inspected. An opaque system would have fixed resources and methods which are not able to be inspected. Bolt's categories correspond broadly with the common distinction made between content-fixed and content-free programs.

For the purposes of this study it is unimportant to report Bolt's assessment of individual programs. It does seem clear, however, that transparency is an asset and it may be significant that the more transparent programs tended to perform better.

Bolt's final assessment of the usefulness of the programs tested in the study can be summarised by the following quote:

> "As users of language we should not accept programs that seem not to have a sufficiently high understanding of and respect for our profession."
>
> (Bolt 1993:185)

In another study of grammar checking programs Wresch (1988) reports the use of a number of packages: *Writer's Helper, Sensible Grammar, RightWriter, GhostWriter, Writer's Workbench, Success with Writing* and *Grammatik II*. Wresch judges these programs as very limited functionally in that they catch phrasing errors but not fundamental grammar errors. He reports that students and teachers are positive about the use of such programs because they help to eliminate the grosser errors in student writing.

7.3 Grammar Checkers and Learning a Second Language

Although the study by Bolt described in the previous section is quite comprehensive in the number of programs tested and compared, it can be criticised on the grounds of the representativeness of the input data. Many of the erroneous sentences used as input seem to be artificially constructed to illustrate an error class. For example it is unlikely that the following sentences (used in the study) would commonly occur in the writing of many users:

> The woman is expects a important letter from he or she.
> The man that could has falls were tired.
> An young dog arent eats the smelly fish.

A more realistic test of the capability of the programs would be to test them with frequently occurring errors derived from real writing. The author has attempted to do this using typical second language errors drawn from the EAP Series and from Jowitt and Nnamonu (1985). The following output from two grammar checkers, *Editor* and *Correct Grammar*, shows very poor performance, even for less artificial errors.

Given the input:

> "In post colonial Africa of today women have different roles."

Correct Grammar responded:

"Consider *rolls* instead of *roles*.

This context seems to require a verb rather than a noun. *Roles* is a noun that means *parts*. *Rolls* as a verb means *revolves*."

For the input:

"Very few women occupy high status roles in the society as cabinat ministers, senior civil servants, doctors lawyers and so on."

Correct Grammar responded:

"Consider *doctors'* or *doctor's* instead of *doctors*.

A plural noun that modifies another noun may be an error for the possessive form (which uses an apostrophe). Plural nouns are, however, used in certain phrases and titles, such as *employee benefit plan* or *field operations supervisor*."

It must be concluded that although grammar checkers would seem to have great potential in assisting the student to monitor written language, their actual performance at the current stage of development renders them largely useless for learning and teaching purposes at this stage. However, it is likely that these programs will improve as research in this field continues so that they could in time become extremely useful. In the interim, programs which offer more structured editing practice, like *Write to Improve*, seem to offer a more reliable, if less individualised, method for helping students to develop their proof-reading and editing skills.

Chapter 8

Towards a Computer Assisted Language Development Environment.

The discussion of the previous chapters has been motivated by the need to find effective ways of supporting language development within the context of academic development programmes. The central concern is that there are many students for whom limited English language proficiency is an insurmountable hurdle to academic achievement at universities. Many different approaches to using computers to support language learning have been examined. This concluding chapter outlines a possible approach to combining different CALL methods in order to support language development courses in Academic Development programmes.

8.1 Computer Assisted Language Development

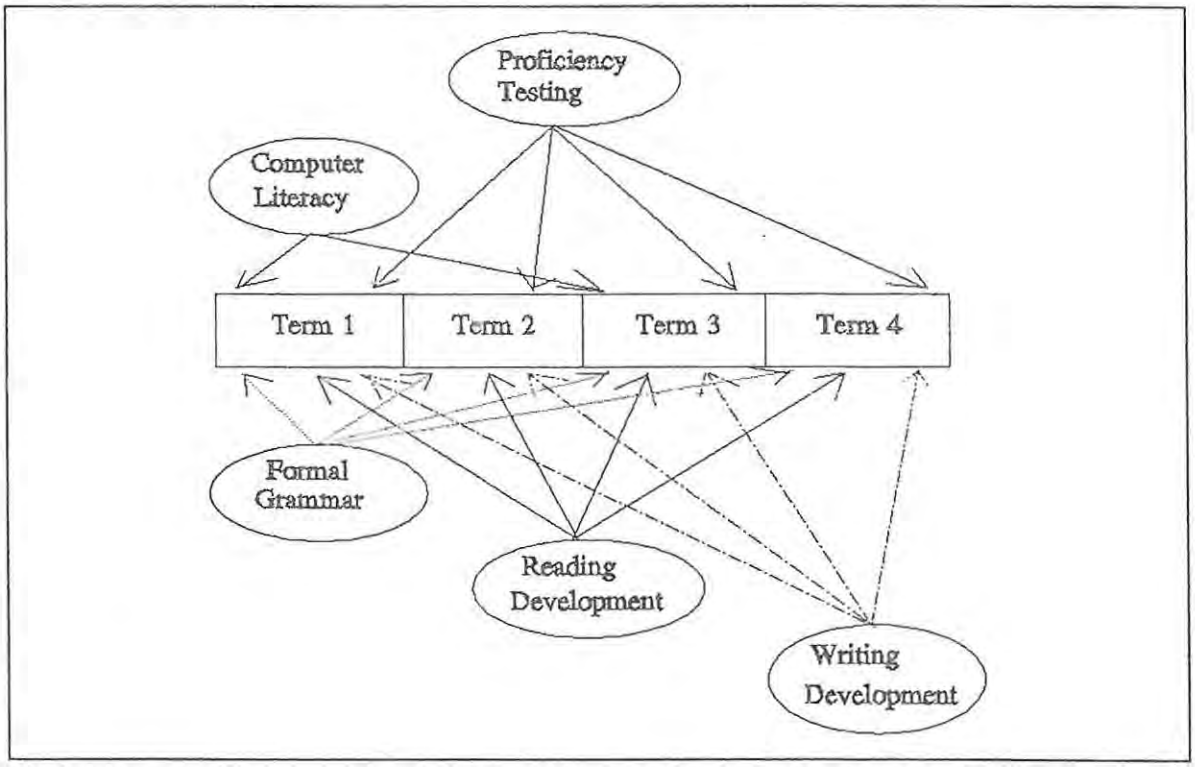


Figure 13: A Computer Assisted Language Development Environment

Figure 13 shows the possible coordination of computer assisted language development methods. Bearing in mind that activities should as far as possible be authentic in relation to

the rest of the students' curriculum, all computer assisted exercises would have to be planned either to be integrated with the curriculum or to complement or supplement ordinary curricular activities. Examples of this coordination are given in the detailed discussion which follows.

In the figure the blocks marked Term 1-4 represent the student's language development curriculum. This may be a course like the EAP series. Computer assisted exercises would then be developed to link with the learning in the EAP course. This would involve a combination of tests, instructional programs and the use of the computer as a tool.

The model illustrated in Figure 13 shows five major areas in which computer support could be used: computer skills development; language testing; formal language instruction; reading development; writing development. A programme for scheduling the exercises would need to be developed which at the same time would link with the learning in the EAP course. The arrows in the figure represent computer assisted exercises which supplement or form part of the curriculum. A brief analysis follows of possible exercises in each area and how these could link with the EAP course.

8.2 Computer Literacy

To facilitate the use of CALL it would be important to present a computer skills course which introduces the student to the systems and software to be used. Tasks would begin to introduce language learning but the focus would be more technical. It would be imperative to provide a typing tutor for those students who need to develop their typing skills. A basic knowledge of word processing would be required and enough knowledge of the operating system and utility programs to ensure that student become self-sufficient users. Where computer facilities are networked, the knowledge of operating systems and utilities would need to include familiarity with network operation and utilities such as electronic mail.

Students could do an introductory course starting at the beginning of their academic year or even during an orientation period. It is likely that after an initial course students' computer skills would improve gradually through practice during the CALL exercises, a side benefit

of the approach. If necessary, an advanced course could be considered if students required this. It is often the case that users will stick at a comfortable but relatively inefficient level if they do not get further training.

8.3 Diagnostic and Research Applications

Teachers may find it valuable for diagnostic and research purposes to test the language proficiency of students. The frequency of testing would be determined by the purpose of the testing. An initial test may need to be on paper but, assuming the involvement of the students in continuous computer training and use, substantial parts of subsequent tests could be computer-based.

Tests could include essays, objective item testing, and cloze tests. Research shows that results from these kinds of tests can correlate very positively with other measures of language proficiency (Graham 1987:507). Using the computer for the latter two types of tests could ease the pressure on the teacher's time significantly. Testing programs would also be an efficient means of presenting self-assessment tests or doing self-monitoring exercises such as the reading skills questionnaire (Murray and Johanson 1989:88). The data obtained from these kinds of exercises would also be valuable research data for the teacher and assist in formative assessment of the course.

8.4 Formal Language Instruction

The literature survey and the original research in this study indicate that although direct grammar instruction is not thought to be effective and is not accepted easily by students, there is a place for grammar instruction in the context of language development. Participants in the teacher discussion group indicated strongly that students are willing to learn formally about the language and seem to benefit from doing so if they see the connection between the instruction and the development of their own writing. Judging from this evidence there would seem to be a place for a formal grammar instruction component within the CALD environment. This component could make use of a number of different types of computer programs: custom-written tutorial and drill exercises (e.g. UWC editing course); Cloze and

text reconstruction exercises (e.g. *Gapmaster* and *Storyboard*); specific editing exercises (e.g. *Write to Improve)* and more general editing using a word processor (possibly including guidance through the use of macros); exploratory language exercises using concordancers, and possibly also spelling, grammar checking and thesaurus utilities connected to a word processor. An example of how a thesaurus could be used in exercises which link with the EAP series is shown Appendix B.2.

8.5 Reading Development

The reading development component of the environment could make use of the computer medium to implement many of the ideas from the EAP series, particularly Read to Learn. The exercises on developing a critical, interactive attitude towards reading could benefit by being presented on the computer. For example, a range of texts could be made available to students so that they could pick a text relevant to their learning. The idea of constructing a conversation with the text could work well on the computer. There are various possibilities: using a split screen, a notepad, a second document, footnotes, endnotes - all facilities commonly available on word processors. An immediate advantage of using a word processor for the reading and interaction with the text would be that the student would have comments on disk which could be included in later writing about the text or about the subject of the text.

An obvious application of the computer for reading development is in the improvement of reading speed. Murray and Johanson (1992:32) report reading speed gains of between 60% and 147% and comprehension gains of between 11% and 37% for student groups at Makerere University after a seven week reading improvement course. A number of commercial speed reading courses are available for the computer medium. It would be important to select a package which allows the teacher to change the text so that reading tasks would be authentic as well as being aimed at improving skills.

Vocabulary development, as an important aspect of reading development, could be facilitated by the computer in a number of ways. Particularly in cases where a core of technical vocabulary is necessary, specific drill programs could be used. Dictionary and thesaurus

programs linked to a word processor could be used to support vocabulary development. For example, students could read a text which is rich in technical or conceptual vocabulary and be asked to explore word meanings with the aid of a dictionary or thesaurus. The use of a thesaurus could be particularly useful in broadening a student's vocabulary. An example of this application is shown in Appendix B2.

Students who would be willing to learn by exploration in this way would probably move on to using concordancing programs quite naturally to explore the usage of words. This has potential to stimulate students to explore grammatical patterns and so support the more formal grammar instruction component of the environment.

Murray and Johanson's (1992:99) approach to the process of reading for academic purposes would benefit from the use of computer tools like word processing. The construction of mind-maps and tables to assist in summarizing (p.111) and synthesising (p.147) information can be done effectively with a word processor. An example is given in Appendix B.1. An immediate advantage of the computer medium over a more graphical representation on paper is that the map of concepts can be used as the structure of an assignment without needing transcription. The ease of making changes may also encourage students to reformulate maps more thoroughly.

The section in Read to Improve dealing with finding and using sources of information is particularly well suited to the use of computers because information storage and retrieval is increasingly being done by electronic means. A library education module could profitably be done on the computer, perhaps simulating the use of the real cataloguing system in use at the university's library as a first step to the use of the real catalogue. A CAL library education package could require students to search for information in the library and check the student's success in doing so. Teaching students to use contents pages, glossaries and indexes could be made authentic and dynamic by showing students how to generate these for their own assignments, or from sample texts provided for this purpose. The facilities available on word processing programs make it relatively simple to generate tables of contents and indexes and students could be shown how to use a supplementary dictionary as one of the sources of items for an index or glossary.

The further practice section of Read to Learn would benefit from computerization where students are using the text without a teacher. The section is well suited as it is in fact designed to be able to be used in a programmed learning mode. A sample is shown in Appendix B3.

8.6 Writing Development

Write to Learn is a detailed guide to developing academic writing skills. The core of the approach is training the student to apply the cycle: **think, plan, draft, revise** (Murray and Johanson 1990:26). Detailed comment in Chapter 3 of this study indicates the suitability of word processing and other tools for this approach. Planning, drafting and revising are all facilitated to a great extent by word processing.

Goodyear (1993) reports the positive effects of using dialogue journals to stimulate student writing, as well as mentioning social and affective benefits. The use of dialogue journals could be enhanced by using electronic mail as the means of communication (Rollnick 1993). Electronic discussion groups are another possibility for students who are ready to test their writing skills in a forum with peers and tutors about popular or academic topics.

8.7 Recommendations for Further Research

The above suggestions for establishing a computer assisted language development environment are generally relatively easy to implement technically. Few would require the development of programs. The challenge would be to develop stimulating and productive language learning exercises. As suggested earlier in this chapter, a start could be made with material from the EAP series. The integration of computer assisted materials into a more general language development course would be highly desirable.

Materials and approaches would need to be tested by using them realistically with a group of students. It would seem that a combination of qualitative and quantitative methods within a broad framework of Action Research would remain suitable for this purpose. However, further research in this area should concentrate more fundamentally on student perceptions

and language learning gains. The present study is limited in the sense that it does not intend to do more than pilot a broad approach. Because of this, the primary focus on teacher perceptions was necessary. It is suggested that further research should be conducted as part of a larger project which attempts to create a realistic CALD environment as suggested in this chapter. Small studies, such as the present, suffer from lack of context and authentic student involvement.

Regarding the *Write to Improve* software system, it is recommended that the system be used as part of the proposed environment. This would allow a more thorough and realistic test of its usefulness with a bigger student sample. It would be important to study student use of the system more comprehensively in a number of areas: the graphic user interface in relation to computer literacy; student interaction with the system in relation to language competence and interlanguage; effects of sustained use of the system on formal grammatical knowledge and its usefulness as a monitor for students' language production. It is likely that strictly empirical methods would remain unsuitable for studying these areas since the range of variables and influences on students' language development is too complex to control. Methods used in the present study should be refined and extended.

8.8 Conclusion

Computers have been used in the instructional process for roughly two decades. Success has been modest and restricted to a limited number of institutions. The increasing availability of computers and, significantly, of networked computers, coupled with the wide range of software available for the development of CALL materials by language teachers without specialist computer training, presents a considerable opportunity and challenge.

CALD environments promise improved opportunities for ESL students to become more vitally and productively involved with their own language development. At the same time teachers in this sphere may benefit significantly by using the technology to support their teaching. ADPs should pursue the use of the computer as an interactive medium for enhancing student learning. In particular it seems that returns on investment of effort in the area of CALL may

be more significant than in other areas of CAL because of the suitability of commonly available computer applications for language learning and teaching.

REFERENCES

Agar, D. (1990). *SPEN Evaluation - 1988 to 1990.* University of the Witwatersrand.

Agar, D., Hofmeyer J., and Moulder, J. (1991). *Bridging Education in the 1990s: Learning from Experience.* Johannesburg: Edusource.

Alessi, S. M. and Trollip, S. R. (1991). *Computer-Based Instruction.* Englewood Cliffs: Prentice Hall.

Auten, A. (1988). Process Writing Research Topics. In Boone, R. (1991). *Teaching Process Writing with Computers.* Eugene: ISTE.

Balajthy, E., McKeveny, R. and Lacitignola, L. (1986). Microcomputers and the Improvement of Revision Skills. *The Computing Teacher.* Dec/Jan 1986-7.

Bolt, P. (1993). Grammar checking programs for learners of English as a foreign language. In Yazdani (1993). 141-191.

Booth, K. (1993). Computer Based Education. In the *Newsletter of the Gold Fields Science and Mathematics Resource Centre*, UWC. Vol.1:24.

Borello, E. and Italiani, M. (1981). Computer-based Teaching in Applied Linguistics. *Computers in Education.* 3:89-97.

Boughey, J. (1991). Teaching Language in large classes with minimal resources. Unpublished short paper. University of the Western Cape.

Bull, S., Pain, H. and Brna, P. (1993). Student Modelling in an Intelligent Computer Assisted Language Learning System: The Issues of Language Transfer and Learning Strategies. Research in progress. Department of Artificial Intelligence, University of Edinburgh.

Cameron, K. (1989). *Computer-assisted Language Learning*. Oxford: Intellect.

Chamot, A.U. and O'Malley J.M. (1987). The Cognitive Academic Language Learning Approach: A Bridge to the Mainstream. *TESOL Quarterly*. 21(2):227-249.

Chandler, B. (1989). *The Longman Mini-Concordancer*. Harlow: Longman.

Clarence, J. (1991). Critical Language Study in a University Context: Curriculum Development in Learning, Language and Logic. In Starfield, S. (Ed.) *Proceedings of the 6th SAAAD Conference*. Johannesburg: University of the Witwatersrand.

Cohen, L. and Manion L. (1989). *Research Methods in Education*. New York: Routledge.

Collett, P.G. (1991). CALnet - A Computer-based Education Management System. *Proceedings of the Second Conference on Computer-based Education and Training*. Pretoria: University of South Africa. 101-106.

Dison, A. (1993). University of Fort Hare. Personal Communication.

Goodyear, C. (1993). Port Elizabeth Technikon. Personal communication.

Graham, J.G. (1987). English Language Proficiency and the Prediction of Academic Success. *TESOL Quarterly*. 27(3):505-522.

Higgins, J. (1988). *Language, Learners and Computers*. Harlow: Longman.

Hondy, R. (1991). ESL Students' responses to courses offered by the Division of Language Usage. In Starfield, S. (Ed.) *Proceedings of the 6th Conference of the South African Association for Academic Development (SAAAD)*. Johannesburg: University of the Witwatersrand.

Ingraham, B. (1993). The CAMILLE Project. Speakers Notes 9362: British Council Course on Computers in language education and research. Newcastle upon Tyne.

Jefferay, C. (1993). English for Academic Purposes at Rhodes University, 1983-1993. *Discourse.* Newsletter of the Academic Development Programme, Rhodes University. 4(4): 6-8.

John, B., Keal, B. and Inglis, M. (1991). *Readings on the principles of Effective Academic Communication.* Pietermaritzburg: University of Natal.

Johns, T. (1993). Data-driven learning. Lecture notes. University of Birmingham.

Johnson, D.M. (1992). *Approaches to Research in Second Language Learning.* New York: Longman.

Jowitt, D. and Nnamonu, S. (1985). *Common Errors in English.* Harlow: Longman.

Jung, U.O.H. (1992). Technology and Language Education in the 21st Century. *Aila Review.* 9:21-38.

Kahn, J. (1987). Learning to Write with a New Tool: Young Children and Word Processing. *The Computing Teacher.* June 1987.

Kirby, P., Oescher, J., Wolson, D. and Smith-Gratto, K. (1990). Computers in Schools: A New Source of Inequity. *Computers in Education.* 14(6):537-541.

Last, R. W. (1989). *Artificial intelligence Techniques in Language Learning.* Chichester: Ellis Horwood Limited.

Leech, G. and Fligelstone, S. (1992). Computers and Corpus Analysis. In Butler, C.S. *Computers and Written Texts.* Blackwell.

Leonardi, E.B. and McDonald, J.L. (1986). Assessing Our Assumptions. *The Computing Teacher.* April 1986.

Manie, A. (1990). The Role of Computers in the People's Education Milieu. Proceedings of "Computers for All" symposium, Rhodes University Education Department.

Manie, A. (1992). Exploring Academic Possibilities in using Computer Supported Education. In Sharwood, D. (Ed.) *Proceedings of the 7th SAAAD Conference.* Port Elizabeth Technikon. 574-607.

Murray, R. (1990). It's not what you say but how you say it. *PC Magazine.* 11 December 1990:167-169.

Murray, S. and Johanson, L. (1989). *Read to Learn.* Randburg: Hodder and Stoughton.

Murray, S. and Johanson, L. (1990). *Write to Learn.* Randburg: Hodder and Stoughton.

Murray, S. and Johanson, L. (1991). *Teaching English for Academic Purposes.* Randburg: Hodder and Stoughton.

Murray, S. and Johanson, L. (1991). *Write to Improve.* Randburg: Hodder and Stoughton.

Naidoo, A. (1993). The DLU - 1992/93 Evaluation. Division of Language Usage, University of Durban-Westville.

Ngwenya, T. and Hossfeld, L. (1991). Language problems on black campuses: causes and possible solutions. In Starfield, S. (Ed.) *Proceedings of the 6th Conference of the SAAAD.* University of the Witwatersrand. 207-221.

Paxton, M. (1992). Writing Centres - Problems and Possibilities. In Sharwood, D. (Ed.) *Proceedings of the 7th SAAAD Conference.* Port Elizabeth Technikon. 308-315.

Piper, A. (1988). Word processing and writing: some research results. *MUESLI News*. November 1988: 10-13.

Puntambekar, S. (1993). Towards an ITS for Training Metacognitive Skills in Studying from Texts. *Proceedings of the Seventh International PEG Conference*. Edinburgh. 2-4 July, 1993.

Rhodes University Public Relations and Development Division (1993). Report on the Rhodes University Summit, 25/09/93.

Richards, J.C. (1974). *Error Analysis: Perspectives on Second Language Acquisition*. London: Longman.

Richmond, K. (Ed.) (1988). *English for Science Students*. Pretoria: University of South Africa.

Ritter, J.M. (1986). Peer Conferencing, Computers, and Persuasive Writing: A Recipe to Encourage Revision. Centre for Advanced Technology in Education, Oregon. (Reprinted in Boone 1991.)

Rollnick, M. (1993). The use of E-mail in assisting student writing and concept development. In Boughey, C. and Leibowitz, B. (compilers). *Proceedings of the 1993 SAAAD Conference*. University of the Western Cape.

Scott, M and Johns T. (1992). *MicroConcord*. (Software) Oxford: Oxford University Press.

Smith, D. and Keep, R. (1988). Eternal Triangulation: Case Studies in the Evaluation of Educational Software by Classroom-based Teacher Groups. *Computers in Education*. 12(1):151-156.

Smith, N.J. (1992). The process of developing a first year English course for under-prepared students in South Africa: A co-operative project or a separatist venture? *Journal for Language Teaching of the South African Association for Language Teaching*. 26(4):31-52.

Stern, H.H. (1983). *Fundamental Concepts of Language Teaching*. Oxford: Oxford University Press.

Suri, L. and McCoy, K. (1993a). A Methodology for Developing an Error Taxonomy for a Computer Assisted Language Learning Tool for Second Language Learners. Technical Report No. 93-16. Department of Computer and Information Sciences, University of Delaware, Newark.

Suri, L. and McCoy, K. (1993b). Correcting Discourse-Level Errors in a CALL System for Second Language Learners. Technical Report No. 94-02. Department of Computer and Information Sciences, University of Delaware, Newark.

Taylor, R.P. (1980). *The Computer in the School: Tutor, Tool, Tutee*. New York: Teachers College Press.

Thiesmeyer, E.C. and Thiesmeyer J.E. (1990). *Editor: A System for Checking Usage, Mechanics, Vocabulary, and Structure*. New York: Modern Languages Association.

Tribble, C. and Jones, G. (1990). *Concordances in the Classroom*. Harlow: Longman.

Underwood, J. (1989). On the Edge: Intelligent CALL in the 1990s. *Computers and the Humanities*. 23:71-84.

University of Natal (1993). The TTT Programme 1993. Brochure.

Van der Ham, V. (1991). Language Proficiency testing: the selection of students for language support intervention at UDW. In Starfield, S. (Ed.) *Proceedings of the 6th SAAAD Conference.* University of the Witwatersrand. 222-233.

Vermaak, I. and Collett P.G. (1993). Basic Statistics for Psychology: A Case Study in Courseware Development. *Discourse.* 4(4):17-23.

Volbrecht, T. (1992). The Theory that lies behind ESL Materials: The Basic English Language Skills Book: A Personal View. In Sharwood, D. (Ed.) *Proceedings of the 7th SAAAD Conference.* Port Elizabeth Technikon. 308-315.

Voss, J. (1992). The University of Zululand English Grammar Project. Internal Report. University of Zululand.

Watson, D. (1986). Generating Language Learning with CAL. *Computers in Education.* 10(1):181-186.

Walker, M. (1992). Every act of teaching is an act of research - research as a basis for staff development. In Sharwood, D. (Ed.) *Proceedings of the 1992 SAAAD Conference.* Port Elizabeth Technikon. 465-497.

Windeatt, S. (1987). The Use of Word Processors in Language Teaching. In Legenhausen, L. and Woolf, D. (Eds.) *Computer Assisted Language Learning and Innovative EFL Methodology.* Augsburger I & I-Schriften Band 38. Universität Augsburg. 57-69.

Writing Tools Group, (1990). *Correct Grammar.* San Fransisco: Lifetree Software.

Yazdani, M. (1993). *Multilingual Multi Media: Bridging the Language Barrier with Intelligent Systems.* Oxford: Intellect Books.

SOFTWARE REFERENCE LIST

The following list contains details of software refered to in the study. Where manuals in the form of a published book exist, these have been included in the main list of references as well.

CALnet. Computer Assisted Learning Network. Rhodes University (1991, 1993).

CAMMILLE. Computer-aided Multimedia Interactive Language learning Environment. University of Teeside.

Correct Grammar. Writing Tools Group, (1990). San Fransisco: Lifetree Software.

Eurotest. Courseware Eurolinguist®. Nijmegen, Holland.

Gapmaster, Storyboard. Wida Software. UK.

Longman Mini-Concordancer. Chandler, B. (1989). Harlow: Longman.

MicroConcord. Scott, M and Johns T. (1992). Oxford: Oxford University Press.

PLATO®. Formerly a trademark of Control Data Corporation. Now a trademark of the Roach Organisation.

Questionmark. Questionmark Software, UK.

Right-Writer; Grammatik; Reader; Power Edit; CorrecText; LINGER. Publishing details in Yazdani, M. (1993).

TenCORE®. Computer Teaching Corporation, Champaigne, Illinois.

UWC English I Editing Course. (1993). University of the Western Cape CSE Unit and Academic Development Centre.

Write to Improve (software). (1992). Rhodes University.

Writer's Helper, Sensible Grammar, GhostWriter, Writer's Workbench, Success with Writing. Publishing details in Wresch (1988).

Word Perfect 5.1. (1989). Word Perfect Corporation. Orem, Utah.

Appendix A - Analysis of Group Discussion Data

The transcript was analysed to identify clusters of relevant meaning, from which general themes were identified.

1. General Themes

Language Teaching Theory and Practice
Program purpose
Program features
Learner charactersitics
Teacher needs
research
Writing development
Reading development
Curriculum context
Related Programs
Further development

2. Clusters of Relevant Meaning

research tool
collecting data showing which errors students can identify
evaluation
enhancements
refinement according to usage data
teaching resource
diagnosis - which errors can be identified?
proof reading
editing
consciousness raising, developing the monitor
teacher training
configuration
graded program
exercises, texts
editing
other tools
wp
grammar checkers
user interface
computer literacy
visual literacy
software conventions
mirror paper medium
template, mask
presentation
user training, preparation
learner
computer literacy
visual literacy
variations between
errors
teachers views
genre
content free
grammar instruction
linked to

3. Transcription (extract)

T1	That research element might be a way of refining this program in the sense of the data you've got from the research will put you in a better position to eventually make a better program.
T2	There's a degree of sophistication needed to identify those labels. Isn't the idea to initially begin with ... you can identify the errors then possibly the computer informs you what the errors are formally, so that you would be giving them a passage without any formal categories, you'd then correct it and develop those ...
T3	Do you mean you would just get a text with errors, you'd identify an error and then click on that and then the computer would say right ...
T4	You (SM) have an exercise, this is sticking to the book, a progressive summary, then a short summary, then the teacher's corrected summary and also the experienced writer's summary. The instruction to the student was "underline the areas the teacher has changed and explain why." While I was watching just now, that seemed a more ....
R	open-ended way?
T4	Not only that but it would be a more user-friendly system - simply underline or highlight and then select the explanation. Possibly I wouldn't include the experienced writer's part.
T2	What I'm saying is the student would have to learn those abbreviations.
T1	With us the idea of the exercise was to learn them. WE wanted to be able to give the students feedback, mark their work, in such as way as to give them insight as to where they were at, but what we found was (our book developed in this way) firstly that they didn't necessarily pay enough attention to the symbols to know what they meant and they weren't in a position to be able to act on the basis of that kind of correction work, so we had to build in this kind of exercise. Other things we found ... the typical sort of exercise you so with students, exchange work, try and proof read each others', they simply could not proof read each others'. They would come back changed ... (laughter)
R	... with more errors?
T1	and we realised that they needed to be taught to proofread - we were teaching students to proofread and we decided it was an important skill to teach students. So that's what you would be teaching.
R	If there was a initial problem in using the programs because of actually interpreting the symbols you could write a program which would provide drill in this.
T4	or just simply one of those keys which you would leave on the computer to explain the code.
T1	The new teacher would need some guidelines about how to use it. For me, I could use it in different ways, diagnostically say - let's give the student a real piece of student text, see what are general errors which people can't recognise - what are systematic errors which could do with some formal attention. So I would use that and then on the basis of those you could have some sort of formal grammatical explanation and this is where I think it would be interesting to use contrastive analysis, Rutherford's ideas about consciousness raising, not necessarily teaching formal rules but providing students with the kinds of examples which enable them to see, to be able to internalise the rule without having the rule explained to them. Then you might want to feed them back into something like this and see if they have internalised the rules. There is this whole notion about interlanguage, variability of interlanguage, that's what you's be getting into.
T2	I think there is a problem of limiting the scope of this kind of project because there's a huge potential.

Appendix B - Examples of CALD Exercises

B.1 Concept maps

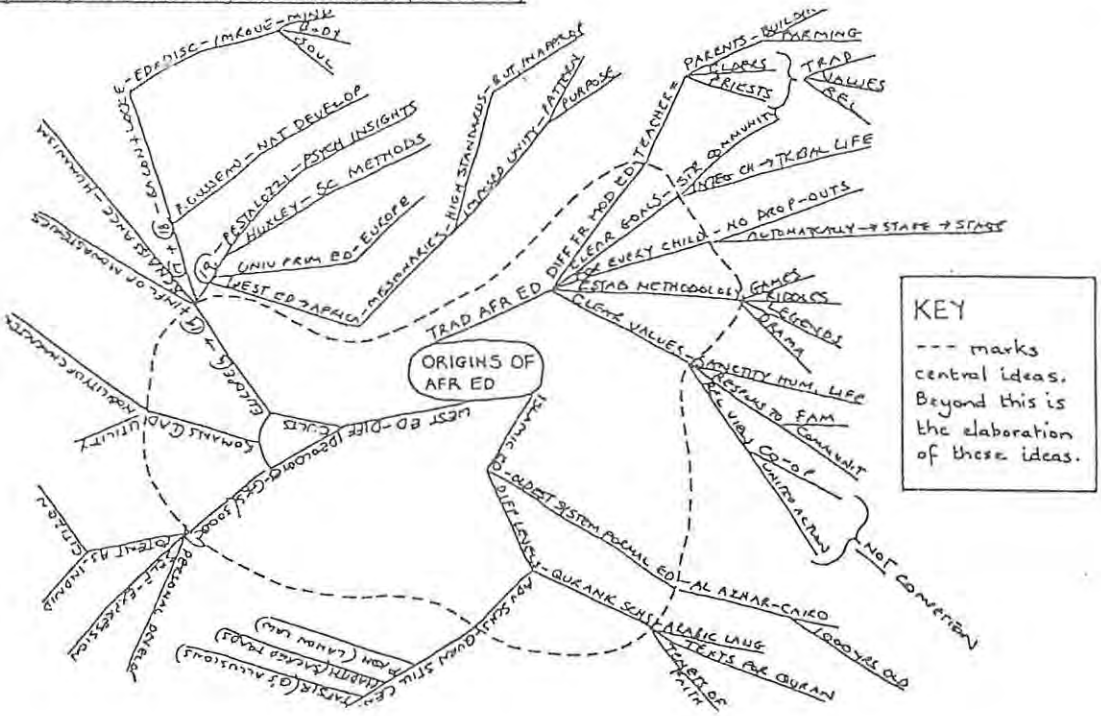
B1.1 Origins of African Education (word processor concept map)

Traditional African Education
- Different from modern education
  - teachers
    - parents
    - elders
    - priests
  - building
  - farming
- clear goals
  - str community
  - integ ch -> tribal life
- for every child
  - no drop outs
  - automatically - stage -> stage
- established methodology
  - games
  - riddles
  - legends
  - drama
- clear values
  - sanctity of human life
  - responsibility to family, community
  - religious views
    - cooperation
    - united action

Islamic Education
- (detail omitted)

Western Education
- (detail omitted)

B1.2 Concept map from Murray and Johanson (1989:111)



B.2 Use of Word Perfect Thesaurus for Vocabulary Development

"Traditional African education had the following features. It was different in many ways from modern education, and was a community responsibility. Despite its apparent informality, it had clear goals, and was for every child. Well-tried teaching methods were used in traditional education, and it had clear values." (Extract from Murray and Johanson:1989:110)

informal (a)	formal (a)	customary (a)
1 . casual	1 A conventional	1 habitual
. simple	B customary	routine
. spontaneous	C prescribed	standard
. unassuming	D standard	usual
. unceremonious		
. unpretentious	2 E prim	2 conventional
	F reserved	orthodox
informal (ant)	G starched	traditional
2 . formal	H stilted	
	I stuffy	3 general
		normal
	3 J ceremonious	ordinary
	K decorous	
	L proper	customary (ant)
	M stately	4 unusual
		uncommon
	4 N definite	exceptional
	O explicit	
	P lawful	
	Q legal	
	formal (ant)	
	5 . unusual	
	. casual	
	. informal	
	. illegal	

[The table above shows the output from the thesaurus program given the words *informal* and *formal*. (The actual screen display is slightly different.) It is interesting to note *traditional* (see also its use in the text) as a possible synonym for *formal*, and then to consider the usage of *informal* in the passage: *Despite its apparent informality, ...* The use of the thesaurus with a dictionary would seem to have rich possibilities for developing students' vocabulary.]

B.3 Extract from Vocabulary Building Exercises

Read to Learn - Murray and Johanson (1989:247)

c) Spelling changes when affixes are added

Prefixes and suffixes are often used to inflect a word so that it becomes another part of speech. When this happens, spelling often needs to change (e.g. **happy — happiness**)

Find the inflection of the given word which changes it to the part of speech indicated. Be careful of spelling.

a) refuse_____ (noun)
b) use_____ (adjective)
c) terror_____ (verb)
d) destroy _____ (noun)
e) beauty_____ (adjective)

---

d) Comparative and Superlative forms of Adjectives

Irregular comparative and superlative forms may be found in the dictionary (e.g. **good, better, best**). Dictionaries may also use a code to indicate whether **-er**, and **-est** are used or **more** and **most**.

Decide on comparative and superlative forms of the following adjectives to fit the sentences below:

good clever popular rich experienced

1. He is a _____ lawyer than any of his colleagues.

_____
_____
_____
_____

2. She is one of the _____ authors in the world.

_____
_____
_____
_____

---

8. Synonyms

When you are writing, you may also need to find a synonym (word with the same meaning) for a word you have used too often. The definitions given in a dictionary are often in the form of synonyms.