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COMPUTER ASSISTED INSTRUCTION AND WRITTEN ENGLISH

by

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The undersigned certify that they have read, and recommend to the
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"Computer Assisted Instruction and Written English" submitted by
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ABSTRACT

There is a general consensus that many college level students
have serious problems with written English. At the same time, research
has indicated that these students will need good writing skills in
order to be successful in the work place. Furthermore, the same
research has demonstrated that the best way to address written English
problems is on an individualized basis. Consequently, there is
currently an urgent need for individualized instruction in English.

An investigation of current instructional methods for college
level English, which includes traditional classroom instruction,
programmed instruction, and computer assisted instruction (CAI),
indicated that CAI offered the best opportunity for individualized
instruction. Therefore, it was decided to create a set of CAI programs
for a microcomputer to teach writing skills.

For practical reasons, it was necessary to restrict the
courseware to certain aspects of English. Following an examination of
the curriculum, it was decided to develop programs to teach use of the
comma and semicolon.

Programs were designed to simulate real world business writing
tasks. Two types of content were used. One program offered the
students business passages to punctuate and the other presented
academic passages. The two different contents were employed to study
the impact of content on the effectiveness of CAI.

Three groups were used in the study. There were two treatment groups, each using one of the two CAI programs with different content, and one control group. Objective tests were used to measure changes in the achievement and attitude of each group.

The results showed that CAI can be successful in teaching certain aspects of written English, namely use of the comma and semicolon, to college level students. The findings indicate that further research should consider expanding the use of CAI into other areas in the written English curriculum.

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CHAPTER I

INTRODUCTION

Over the past few years research has shown that one of the main advantages of Computer Assisted Instruction (CAI) is individualized learning. At the same time, in the area of written English, especially at the college level, there is a great need for individualized instruction. For this reason, interest is growing in the use of computers to aid in improving students' writing skills.

Although the amount of research work has been limited in this area, there have been a number of successful projects designed to teach writing skills with the aid of the computer.

More recently there has been an increased need for the retraining of students going into the business environment because of the impact computers are having on the work place. Students seeking retraining often need serious upgrading of their written communication skills. This is true for two reasons. Bell & Taylor (1979) found that the students entering such retraining programs have poor communication skills in general. Secondly they state that there is an ever greater emphasis on these skills for success in the business world (Bell & Taylor, ibid). Therefore, students entering the work force are prevented from advancing if they do not have good writing skills. What then is to be done?

Students at the college level have more individual kinds of

problems with grammar and usage than do younger students. Many students' writing problems are habitual in nature and that makes them even more difficult to correct without working on a one-to-one basis. However, in some colleges, such as the one at which the present study was conducted, most instructors are faced with large classes. It is difficult, therefore, to give students the individual instruction they need.

Programmed textbooks have been used and have been successful, at least for teaching certain kinds of writing skills. However, the computer offers several advantages over the programmed textbook: the use of the computer has been shown to be a very motivating factor with students; the immediacy of feedback to the user can be more personalized than that offered by a programmed textbook; the relationship between the student and the computer can be more dynamic and animated, thus resembling more closely the relationship between a tutor and student; the computer courseware can be more adaptive to the individual learner's needs (although this is dependent on the complexity of the particular program); some programmed textbooks rely on the student's honesty not to flip ahead to see the answer, whereas there is no such problem occurring with a CAI program; and more accurate and varied records can be kept of a given student's performance in the program. CAI programs have been found to be more effective when compared with equivalent programmed instruction texts (Bell & Taylor, 1979).

With the continued development of microchip technology and the

increased presence of micro-computers in most educational settings, it is no surprise to find computers employed in the area of language arts. The main problem in using computers to teach written language is that, dependent upon what is to be taught, this subject may require the computer to be capable of engaging in lexical, syntactic, and semantic analysis. Such analyses are presently difficult for the computer to do. For this reason the progress of computer assisted instruction in language arts has been slower than in other areas.

In order to improve language arts education at the college level, given the situation already described, it was decided to examine the possibility of using CAI for remedial language arts instruction.

CHAPTER II

REVIEW OF RELATED LITERATURE

Introduction

Good writing is important for success in the business world
(Lindemann, 1982). However, teachers of college level Business English
are often faced with students who have deficiencies in grammar and
usage (Kline, 1979). These deficiencies cause difficulties because the
instructor who is teaching composition must first improve the
student's basic writing skills (Kline, 1979).

There are other reasons, besides success in school and business,
for being able to write well. It is clear that good language skills
help one to organize thoughts, relate ideas, solve problems, make
sense of experience, or communicate thoughts (Lindemann, 1982).
Therefore, good language skills seem paramount to a person's general
growth in life.

A survey completed in 1976 indicated that over 75 percent of
employers felt that punctuation was a necessary skill for graduating
business education students (Bell and Taylor, 1979). At the same time,
punctuation errors have been found to account for as much as 75
percent of all errors in students' writing (Bell and Taylor, 1979).
The errors that these students make in punctuation seem to indicate a
general lack of knowledge about the punctuation rules (Shaugnnessy,
1977). It has also been suggested that the punctuation marks that

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students tend to use most often and most incorrectly are the comma and semicolon (Shaugnnessy, 1977).

Analyses of students' writing have indicated that the problems students have with punctuation are caused by ignorance of the punctuation rules (Shaugnnessy, 1977). Therefore, the first step towards improving students' punctuation skills should be to instruct them in the punctuation rules.

Instructional Strategies for Teaching
College Business English

The three instruction methods employed in teaching college Business English are: traditional instruction (lectures and practice exercises), programmed textbooks, and computer assisted instruction.

Traditional Instruction of Business English

The traditional method of teaching Business English is to present a lesson on grammar rules and then assign exercises for the student to do either in class or for homework (Brendel, 1971).

This method of instruction also involves the use of a writing textbook in which the rules are listed and then some exercises are given. One of the problems with these handbooks is that the approaches in them are highly unsystematic (Southwell, 1982). Also, these books, for the most part, emphasize what is best referred to as "standard English" (Foster, 1983).

The handbooks concentrate on two parts of language arts instruction: organizing and creating the product, and editing and

standardizing the language and style. The textbooks tend to be designed more for teaching basic editing skills rather than for teaching creative writing. This bias towards editing may be due to the fact that it is easier to teach since it is controlled by rules (Foster, 1983).

Programmed Textbooks In The Teaching Of Business English

The concept of programmed instruction was first developed in the late 1950's (Bullock, 1978). Key features of programmed instruction are: it can be self administered, it is self-pacing, and it can give immediate feedback (Bullock, 1978). Therefore, this method of instruction can be described as a method of self instruction where the learner moves through the material in short steps and at his/her own pace (Callender, 1969).

Programmed instruction involves the use of a programmed textbook and an experienced teacher. The programmed textbook usually consists of a number of structured instructional frames which enable the student to interact with the material by the use of problems and questions. The student is given immediate feedback on any and all questions and problems that are presented (Bullock, 1978). The teacher's role in this process is to make diagnostic analyses of the student's progress (Callender, 1969).

The programmed textbook has been introduced into college level English as a way of making instruction more individualized when the teacher to student ratio would not permit this otherwise. It has been

supported by the research findings that programmed textbooks work best

with material that is most easily mastered through repetition and

practice (Perkins, 1971).

Programmed instruction is often incorporated into the business

English curriculum by the teacher giving each student a pre-test to

diagnose his/her needs for a given area. The student is then presented

with programmed lessons relating to the weaknesses that have been

diagnosed. Later a post-test is given to the student to determine if

mastery of the material has been achieved (Brendel, 1971). A student

meeting the mastery criterion is advanced to the next area; however, a

student not meeting the mastery criterion must be assigned additional

material and a second post-test must be completed (Brendel, 1971).

This means that the mastery criterion is set so that students are not

forced to repeat sections too many times.

There are indications that programmed learning can be as

successful as traditional methods of instruction (Bullock, 1978).

Programmed instruction can narrow the gap between students because

those students with lesser ability receive the benefit of extra

exercises (Perkins, 1970).

However, the research also indicates that there are several

problems that can arise when using a programmed learning approach. One

problem is that some students will not take the initiative in their

learning but will put off completing the textbook assignments

(Brendel, 1971).

Another concern is that enrichment activities must be provided

for those students who finish early. If further activities are not given, then many of the advantages gained by the individualized instruction will be lost (Brendel, 1971).

Some students find programmed instruction boring and they prefer learning from human interaction rather than from solitary learning activities.

Finally, the design of programmed textbooks is such that students can easily flip ahead to see the answer to a problem. Therefore, it can be easy for students to abuse the system.

Computer Assisted Instruction and Business English

The use of computers in education has been developing for several decades (Hallworth & Brebner, 1980). In that time period, there has been a great growth in awareness both among educators and the general public, as a whole, with regard to the possibilities of computer applications in education.

Two main applications are Computer Managed Instruction (CMI) and Computer Assisted Instruction (CAI). The present study is concerned with the latter.

Computer Assisted Instruction has been defined as the use of computers in an interactive manner where the computer both presents material and receives, analyzes, and acts upon responses from each student on an individual basis (Hallworth & Brebner, 1980). The emphasis here is on individualization.

The research to date has substantiated the claim that CAI can offer students individualized instruction (Simutis, 1979). Although

nearly all areas of instruction can benefit from individualization, it is especially relevant to language arts: the computer can be an important instructional tool for language arts teachers (Wisher, 1978).

However, the biggest problem with using computers to teach language arts has been the computer's inability to process natural language (Southwell, 1982). This problem has partially contributed to the fact that most of the courseware which has been designed for the language arts has been drill and practice or tutorial (Wresch, 1982). These kinds of programs can be written more easily because the student's responses can be limited to one letter. However, programs written in this manner may not be the most effective type of courseware for the subject of English.

The first major projects using computer assisted instruction date back to before 1960. The early projects were often limited by the slow and error prone hardware and software used. However, in the past two decades the improvements made in hardware and software have greatly enhanced the feasibility of learning by computer.

The initial research clearly indicated that CAI can be very successful in offering the student (and the instructor) the opportunity for standardized and efficient instruction (Simutis, 1979).

Another significant contribution of CAI, documented by research, is the positive and immediate feedback that it can provide (Southwell, 1981). At the same time, computer assisted instruction has been found

to be cost effective, to provide retention of information, and to give students a positive attitude to learning, when compared with traditional instruction (Schuelbe & Thomas, 1982).

History of CAI

The history of CAI consists of two main developments.

The early projects in the 1960's and 1970's were for the most part large research projects such as PLATO (Bitzer et al, 1967), Stanford and CCC (Macken & Suppes, 1976), or TICCIT (Alderman, 1978). These large systems were developed on either mainframe computers or minicomputers, with a large number of terminals attached, and offered both adjunct and mainline instruction. In adjunct instruction, the computer is used in conjuction with regular classroom instruction while in mainline instruction the computer presents all the material.

The second development was the introduction of the microcomputer into the regular classroom. Projects such as MECC, TIES and recently PLATO, all of which began using mainframe systems, have since begun converting to micro-based systems (Hallworth & Brebner, 1980). There has also been a huge growth in the courseware available for both the Apple II and Commodore Pet computers.

The large systems offered a lot of extra resources to the student. For example, they monitored progress and branched when necessary to remediation or easier examples, as on the CCC system. A micro-based system, on the other hand, is much more limited in the kind of support it can provide. However, the microcomputer does offer several

advantages over the larger system. First, it is much less expensive to acquire or maintain. Secondly, it can be installed more easily and requires fewer support staff to maintain it.

Teaching Strategies Used In CAI

The three main instructional strategies used in CAI are drill and practice, tutorial, and simulations and games.

The drill and practice strategy may be used to present the student with a number of drills or exercises in an area where (s)he may be having difficulty. The problems are often presented randomly. Some programs offer the student hints if (s)he has been unsuccessful. The student may or may not be given a choice in the number of problems (s)he receives. Also a report of performance on the exercises may be given at the end of the program. Research has shown that in many subjects, including language arts, drill and practice programs can be very effective instructional tools (Alderman, 1978).

Tutorial programs give instruction on a topic, then the student's understanding of the material is tested. The student demonstrating an adequate grasp of the material may be presented with a new block of material, or may receive drill exercises which give more practice. If performance on the practice exercises indicates that the lessons so far have not been mastered, the student may be transferred to a remedial branch which gives more instruction.

Simulation programs may be used to present the student with real life problems where the student must develop strategies to obtain a result. These kinds of programs permit the student to experiment with

various strategies without facing the real life repercussions. In this way, the student is able to learn or develop some of the skills necessary to solve similar problems when they occur in real life. Programs of this type are usually used in the sciences, social studies, geography, or history, where cost or danger or time often does not permit the student to actually test different hypotheses.

CAI And English

In the teaching of English using a computer there are a number of important concerns. One is: do we teach mechanics? do we teach composition? or do we teach both? A second is: how do we write programs that can anticipate all the possible answers a student may give? A third is: how can we design programs that will aid the computer in processing natural language (Schwartz, 1982). The last concern is: can we write programs that will evaluate the textual response of students? In order to do the latter, an evaluative routine must be written that is flexible enough to process a number of possible answers but not so flexible that it will permit students to enter incorrect responses (Lawlor, 1984).

A review of CAI available for the language arts area revealed that most of the existing courseware (which is either drill and practice or tutorial), because of the use of repetition, may not be suitable for college level students (Wresch, 1982).

However, despite the limitations drill and practice and tutorial programs for English may have, they have proven to be very successful

(Wresch, 1982). While drill and practice programs can help students to master certain skills in language arts, tutorial programs are better for helping students internalize the material (Schwartz, 1982).

Drill and practice programs have been found to be more effective than programmed textbooks or individual tutorials (Schwartz, 1982). Two reasons given for this are student control of the learning process and individualized content. Unlike a programmed textbook, the drill and practice program can be designed to give the student only as many problems as (s)he needs (Schwartz, 1982). Furthermore, the variety of problems, and the variety of feedback, can be greater than that offered by a programmed textbook (Schwartz, 1982).

It has been noted in the literature that students who have severe problems with their writing can benefit more from CAI than from traditional instruction (Southwell, 1982). A recent study to compare tutorial methods of CAI, programmed instruction, and traditional instruction for teaching the uses of the comma involved 172 two-year college students randomly assigned to three treatment groups. The study was conducted over a two week period and found that CAI students achieved at a higher level and completed instructional material faster than students who received the other two methods of instruction (Bell and Taylor, 1979).

Generally, it can been concluded from the research that despite the limitations of CAI it can provide a support system which is important for college level language arts students (Southwell, 1982).

It has been found that exercises using sentences and then

paragraphs of increased complexity will greatly help students to improve their writing skills (Southwell, 1982). At the same time, it has been observed that most of the language arts instructional techniques (for grammar and usage) are artificial because the exercises are not related to the real work they concern (Allee et al, 1979). Programs used to teach punctuation should, therefore, attempt to include context clues in their exercises by adding more detail (Allee et al, 1979). CAI programs that attempt to simulate contextual material can be more helpful than the traditional single sentence exercises found in most textbooks, (Allee et al, 1979).

Projects Using Mainframes and Minicomputers

There are three large projects that are of particular interest in relation to this present study since CAI programs for college level English were used. These projects are PLATO, TICCIT, and CCC.

PLATO. One of the first big projects was Programmed Logic for Automatic Teaching Operations (PLATO). PLATO was started at the University of Illinois in 1960 by Donald Bitzer (Bitzer and Skaperdas, 1969).

The emphasis of this project was to promote instructor developed courseware. The amount of courseware available is still growing today and totals over 6000 hours of instructional material in a vast number of subject areas.

In 1972 an evaluation of the PLATO system was carried out in five community colleges (Murphy and Appel, 1977). The study concluded that although PLATO had no statistically significant effect on achievement

or attrition, it did have a positive effect on student and instructor attitudes (Murphy and Appel, 1977). The general indication was that instructor development of courseware was important to the success of PLATO.

The biggest disadvantage of PLATO was the cost of the hardware. The system received much heavier funding than normal in order to get started. The terminals that PLATO used featured a special plasma display which helped to greatly improve courseware development because of improved graphics capability, but it also was expensive (Murphey and Appel, 1977). The instructor development of courseware made it expensive and lacking in consistency

English on PLATO. Research at the Computer-based Education Research Laboratory (CERL) at the University of Illinois from 1972-1976 was conducted on approximately 100 English lessons developed on PLATO.

Sixty-five of the lessons were contained in the Language Arts Routing System. The routing system allowed the instructor to select the topics considered to be relevant for a course. The students were then tested on each of these topics and those students not reaching a specified criterion for a topic were given computer instruction on that topic.

The lessons in the routing system covered the areas of capitalization, composition, editing, grammar, poetry, punctuation, spelling, vocabulary, and word usage.

In 1974 a Language Arts Routing System consisting of four

categories (grammar, punctuation, spelling, and word usage) was created. By the end of the next year the system consisted of 65 distinct topics with short diagnostic tests for each topic. The English courseware was developed either by community college instructors or the CERL staff (Murphy and Appel, 1977).

The PLATO system at the University of Alberta, which was previewed by the experimenter, contained lessons on the comma and semicolon authored by Sally Wallace of Parkland Community College. The lessons began with a menu which allowed the student to select a comma or semicolon rule to study. Once a choice had been made, the system continued through each subsequent menu selection without returning to the main menu. The student was permitted to quit the program at anytime.

The main method of instructional delivery for the lessons was tutorial, with exercises and post-tests. If the student met mastery criterion on the post-test for a given section (s)he was moved to the next rule. If mastery criterion was not met remedial instruction was given followed by another test.

Each section began with presentation of the rule followed by elaboration and questions related to the rule. If the student answered correctly, (s)he was moved to the quiz section. The exercises and the quizzes usually required that the student identify the correctly punctuated sentence from a list of sentences. The answering format was multiple choice. Therefore, there was no provision in any of the sections to permit the student to punctuate the sentences. All tests

and exercises used single sentences so that no effort was made to incorporate contextual clues into the exercises.

In 1981 an evaluation of PLATO English grammar programs was conducted at Indiana University. The 44 students using the CAI English programs throughout the semester showed a significant increase in mean achievement score from pretest to posttest, whereas the 16 students in the non CAI section showed no increase. A "semantic differential" test was used to measure attitude and the results indicated that the majority of students had a positive attitude to PLATO (Oates, 1981).

In 1978 field tests were carried out in Baltimore on the Basic Language Skills programs written on PLATO. These programs were written for an adult literacy program. The students showed large gains in achievement over a short period of time (Rizza and Walker-Hunter, 1978).

TICCIT. The Time Shared Interactive Computer-Controlled Information Television or TICCIT system was developed in 1971 by the Mitre Corporation in conjunction with the University of Texas. The main areas of instruction were college level Mathematics and English (Alderman, 1978).

The project was designed to permit the student to control his/her own instruction. The student decided the topic to be studied, the instructional sequence for learning the material, and the difficulty level of the instruction (Alderman, 1978). The project employed two mini-computers for courseware delivery.

An evaluation of TICCIT was performed based on the participation of 5000 community college students (Alderman, 1978). The results indicated that students receiving English instruction from the CAI programs did not score significantly higher on achievement tests than did students receiving traditional classroom instruction. However, the CAI students did score higher. It was also found that self-directed instruction for the community college student had a negative effect on course completion.

Further, the study revealed that in those classes where the teacher took a more active role in explaining the subject matter and reviewing assignments, the students showed an increase in positive attitude to CAI (Alderman, 1978). The TICCIT program shows the importance of teacher involvement in the CAI process (Alderman, 1978).

English On TICCIT. The TICCIT project had a full introductory college English course (Alderman, 1978). The course was divided into units, and each unit covered topics such as Sentence Faults, Punctuation, Spelling, Writing Paragraphs, etc. Each unit was then divided into a number of lessons (usually between 3 and 8). For example, Unit Four, which was on Punctuation, was divided into six lessons. The lessons were further broken up into segments with approximately three to six segments per lesson. A segment covered one objective and was divided into a rule, example, and practice exercises (Alderman, 1978). The student had the option of seeing the rule or of just doing the practice exercises.

The results of the evaluation conducted by Alderman indicated

that students' achievements in English improved as a result of interaction with the courseware, but not significantly more than with traditional instruction. Also, it was found that the students using the English curriculum valued the exercises more, and used them more, than the rule portion. The practice exercises were consistently rated high by the students (Alderman, 1978). There is an indication, here, that the students prefered the exercises over the rules because the exercises provided the students with immediate feedback on their performance (Alderman, 1978).

The findings in the TICCIT program provide valid points for consideration in the present study. First, the students preferred the individualization and immediate feedback of the practice exercises. Secondly, the students completed the course material in less time. Thirdly, the students performed as well as or even better than those receiving traditional instruction (Alderman, 1978).

CCC. The Computer Curriculum Corporation or CCC was founded in 1969 by Patrick Suppes to commercially distribute some of the courseware that had been developed at Stanford University. The complete system of hardware, software, and courseware had to be bought.

The main instructional technique used by CCC was drill and practice. The material was structured in strands with each strand corresponding to one content area within the curriculum. Examples of the strands in elementary language arts were Verb Usage, Pronoun Usage, and Modifiers. The material within a given strand consisted of

a string of related items which progressed in difficulty from easy to
hard (Macken & Suppes, 1976). Also the student's performance and
postion within a given strand were monitored by the computer and the
student's performance was evaluated against a preset performance
criterion. The computer then determined whether the student needed to
practice at the same level of difficulty, move to an easier level, or
move to a more difficult level (Macken & Suppes, 1976).

Unlike the TICCIT system, the CCC courseware regulated the
student's progress through the system. The courseware tested the
student at the beginning of the course and the performance obtained on
the first lessons was used for placement. During the CAI sessions, a
student had to meet mastery criterion in a concept before moving to
the next concept or level.

Evaluation of the CCC system, involving 11 evaluation studies
from nine states in the U.S., indicated a very positive gain in
achievement (Macken and Suppes, 1976). However, others have commented
that this system may, in fact, structure the learner's experience too
much. CAI should not attempt to regulate the student's progress too
strictly. Rather, this should be more in the hands of the classroom
teacher (Hallworth & Brebner, 1980).

English On CCC. The CCC project had only two units which were
relevant to the present study. They were Adult Language Skills I and
II.

The evaluation of other CCC courseware indicated that it resulted
in improved student achievement which supports the results noted for

the other projects. However, little data were obtained on

student's performance on Adult Language Skills I and II courseware.

Projects Using Microcomputers

In the past few years microcomputers have become very prominent

in the school setting. However, at the moment there is still little

empirical research reported on the use of microcomputer based systems

in the schools. A search of the ERIC system returned only a few

isolated articles. A recent survey, conducted by the Ontario Institute

for Studies in Education (O.I.S.E.) concluded that there was

a lack of language arts courseware for microcomputers. The report also

stated that there was a lack of information on the effectiveness of

microcomputer use in the language arts (Canale et al, 1984).

Whereas applications on the large systems were often developed

over a number of years with a dedicated research team, much of the use

of microcomputers has been by the classroom teacher working with

packaged software such as that available from MECC, TIES or Milliken.

Despite attempts to develop an educational microcomputer model,

like the ICON now being produced in Ontario (Emery, 1983), most of the

CAI courseware has been designed for all purpose microcomputers like

the Apple II or the Commodore Pet.

Courseware from a number of the large systems, such as MECC,

TIES, and PLATO, has been converted to microcomputers. Educational

publishers have also begun to produce courseware for the microcomputer

educational market. In fact, for the Apple II and the Commodore Pet

there is a great deal of courseware available. However, how much of this courseware is good instructional material is still undetermined. The lack of availability of good courseware for microcomputers has been cited as a potential problem in the implementation of microcomputers in education (Hallworth and Brebner, 1980).

The IBM PC, which has become very prominent in the business world since its release, still has little college level educational software available for it. A search of the Regional Information and Communication Exchange (or RICE) database from RICE University in Houston, Texas, which holds a listing of over 2000 educational programs, failed to turn up a single program for the IBM PC on college level language arts.

Microcomputers and Langauge Arts. A recent review of language arts courseware revealed several new projects that incorporate the use of the micro-computer (Shostak, 1984). Unlike the large projects, most of the articles on uses of the microcumputers are subjective reports which incorporate little empirical research data. Included in the survey were Compupoem (available for the Apple II) and Quill.

Compupoem, developed by Stephen Marcus at the University of California, is a program that allows students to write poems with the aid of the computer. It is currently available for the Apple II+ or the Apple IIe. By helping students to create poems, this courseware is aimed at improving students' composing abilities and attempts to work at all stages of the composing process (Shostak, 1984). Rather than creating poems by randomly selecting poetic phrases from a data bank,

this program first instructs the student to think about what (s)he wants to say and then provides an opportunity to see, immediately, reproductions of the poem in various formats. This gives the student more control over how the poem will look and forces him/her to generate ideas and think first about what (s)he wants to say (Shostak, 1984).

Quill is a CAI writing curriculum which is designed for the upper elementary grades. The program is designed to lead students through the different procedures involved in the writing process. The package has six modules that concentrate on planning, integrating reading and writing, publishing, communicating electronically, writing with peers, and revising (Shostak, 1984). A pilot test was conducted in 1982-83 and further testing is being done in 1983-84.

Another program called SEEN (Seeing-Eye Elephant Network) was developed by Helen Schwartz for the Apple II+. It is designed to help students get started with selecting topics to write about (Schwartz, 1984). The program attempts to help students generate ideas through the use of thought-provoking prompts, to promote the refining and shaping of ideas by giving and getting feedback anonymously, and providing a record of their development process so that they can learn how to repeat the process in the future without the aid of the computer (Schwartz, 1984).

Prewriting activities have been developed by Hugh Burns (Lowry Airforce Base Denver Colorado), Helen Schwartz (Oakland University), Don and Ray Rodrigues (Wresch, 1984).

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The Writer's Helper is a composition program available for the Apple II+. The program has three parts: prewriting activities, word processing, and analysis of the student writing (Wresch, 1984).

Aside from these newer developments which concentrate more on composition there is little available language arts courseware (especially for college level) for the microcomputer. A review of the RICE database turned up a list of only 14 programs on language arts. Of these only three were specified as being for the post secondary student. All of the fourteen packages were available for the Apple II+ or Apple IIe. However, none were available for the IBM PC.

The most extensive of the college level packages listed on the RICE database is from Intellectual Software, Bridgeport, Connecticut and is called Grammar Series. The package consists of drill and practice and tutorial programs available on 13 diskettes. The topics range from verb agreement to uses of the comma and semicolon. No empirical research is reported on the effectiveness of these programs.

Conclusions

In order for students to be successful in the business world, they must be able to write well. A review of the related literature indicates that college level students, particularly technical and business orientated students, often initially require a review of English grammar. Further, it has been discussed in the literature that punctuation is an area where many students need review (Kline, 1979).

At the same time, it has been found that students at this level need to have more individualized instruction. Computer assisted

instruction is one way that individual instruction can be provided. Therefore, there is a great need to develop CAI to teach college level English.

It was also discovered, upon reviewing the literature, that most of the CAI written for English review has been either drill and practice or tutorial. The exercises in these programs have been found to be artificial because they are too removed from the real world setting (Allee et al, 1979). The studies surveyed also showed that contextual clues are very important for students when working with grammatical exercises (Allee et al, 1979).

Following the survey of the literature it was concluded that there was an urgent need for CAI programs to teach English to college level students. A simulation approach was chosen because it was thought that by using this approach it would be possible to avoid the problem of artificiality found in past research. Since many of the programs written in the past did not make an effort to account for contextual clues, it was decided to use passages instead of single sentences. Also, it was decided to design the programs so that the students would be able to edit passages directly rather than merely select answers from a multiple choice framework. Furthermore, the literature emphasized the importance of basic grammar review and the importance of teaching punctuation codes.

It was with the above points in consideration that the present study was conducted.

CHAPTER III

COURSEWARE DESCRIPTION

Introduction

Many students entering college need to have their English skills upgraded. However, the traditional methods for teaching such skills at post secondary institutions have been limited by the lack of individualized instruction available for each student.

The principal objective of the present study, therefore, was to determine if microcomputers could be used to teach some aspects of English grammar skills to college level students. In order to do this effectively, a research design was chosen that used a control group, which would receive the traditional classroom instruction, and two experimental groups, which would be given English instruction via CAI courseware.

The content area chosen for instruction was uses of the comma and semicolon. This topic is covered in most college level English composition courses because, as research has shown, it is one in which most students require additional instruction. To teach the uses of the semicolon and comma adequately, it was customary at the present institution for students to be given three hours of classroom instruction and one or two hours of outside homework.

A second objective of the study was to determine if a computer-based simulation program could be effective in teaching English to college students. There were several reasons for wishing to

investigate this method of teaching.

First, simulation programs have been found to be very motivating. It was decided to take advantage of this fact because many adult students are not very interested in their English courses.

Second, drill and practice and tutorial programs might not have presented as much of a challenge to post secondary students. The programs were designed so that students would have practice at punctuating passages without having to read instructional material first. Since students only received instruction when they made errors in punctuating, only those students who needed the instruction would receive it, and then in a manner that would make it more interesting.

It was considered that a program to simulate tasks performed in the work place would be more motivating to students than exercises featuring random sentences. Research has indicated that many language exercises at the post secondary level are perceived by the students as artificial.

A third objective was to determine if a student would learn better if the material presented in the passages (s)he punctuated was business related. To make this comparison, it was decided to use two parallel CAI programs. The one program contained passages that were similar to real world business correspondence. The second program contained material that was more academic in content and, therefore, more like the material presented in many English textbooks.

Since most of the students graduating from business oriented post-secondary colleges, such as the particular institution involved

in this case, would be working in the business world, it was concluded
that they would respond better to content that reflected the business
environment. It was also hypothesized that business content would be
more familiar to the students because it would correspond more closely
to the content already used in other classes.

Content

The content area selected for the courseware was the comma and
semicolon.

The instruction on the comma was broken down into four parts,
namely: use of the comma with items in a series; use of the comma in
compound sentences joined by a co-ordinating conjunction; use of the
comma to set off introductors; and use of the comma to set off
nonessential items in a sentence. These rules are considered to be the
main rules for the use of the comma. Most English textbooks discuss
these four rules first, so it was decided to use only these in the
courseware.

There are two rules that apply to the use of the semicolon in
English sentences. However, this study concentrated only on the main
rule, namely, the use of the semicolon between two independent clauses
not joined by a co-ordinating conjunction.

The pre- and post- achievement measures tested only the rules
covered in the courseware. It was considered, therefore, that the
exclusion of the other rules from the courseware would not confound
the results.

Traditional Instruction

The present study employed a control group which consisted of students at the particular institution involved. The students in this group received lectures on the comma and semicolon.

The uses of the semicolon and the comma were traditionally taught, at the institution, by lectures followed by assignments employing sentences to punctuate which were taken from the textbook. The student completed the exercises both at home and in the classroom. The assignments were then taken up in class where discussion of the correct answers occurred.

The rules for the comma were covered in two classes of 50 minutes each. In the first class, the use of the comma with items in a series, with compound sentences, and with introducers was discussed. This was followed by a homework assignment of twenty questions from the text. The homework took approximately 50 minutes for a student to complete. For the second class the rules for using the comma with essential and nonessential items were discussed and examples given. This was followed by in-class work on ten questions from the text, and twenty questions from a supplementary text.

The use of the semicolon was taught in one fifty minute classroom lecture. Each rule was presented by the instructor followed by several examples that were written on the blackboard.

After all the rules were covered for the semicolon the students were given a homework assignment from their textbook. The assignment consisted of ten sentences to punctuate with semicolons.

Courseware

Two parallel simulation programs were developed. These both had the same structure and followed the same instructional format. The only manner in which they differed was in the kind of content used in the passages the students were required to punctuate.

The first simulation program had "academic content" and featured passages that were more likely to appear in essays. For example:

> Poetry is a fabric woven from the threads of concept, emotion, and sense. Analysis of poetry must take all three into consideration. If it does not, the critic will not have grasped the complete poem.

or

> Only a generation ago, the Navaho were horsemen, nomads, keepers of flocks, painters in sand, weavers of wool, and artists in silver. Today much of this has disappeared, due to the squalid living conditions many of them are forced to live under.

The second simulation program had "business content" and featured the kind of material found in business communication:

> Responsibililty for compliance with this policy falls primarily on department heads, supervisors, and security personnel. Personnel throughout the Company are authorized to request unidentified individuals to produce valid identification or otherwise identify themselves.

or

> The rise in theft and the increase in the number of reported -assaults on the company property compel us to enforce strictly the policy that all employees wear their ID badge at all times while in the facility. Also, all packages, handbags, briefcases, and shopping bags will be inspected on leaving the building. Anyone who does not cooperate with the security guards on this will be subject to severe penalty.

Both simulation programs consisted of five modules, each presenting one topic. The five topics were arranged in the same sequence used in most textbooks, and were as follows: comma with items in a series; comma with compound sentences joined by a co-ordinating conjunction; comma with introducers; comma with nonessential items in a sentence; semicolon with two independent clauses.

The student had to complete all five modules in order to complete the program.

An initial main menu offered the following choices:

1) Instructions

2) Begin Simulation

3) Continue Simulation

4) Exit

The first option gave the student a general introduction to the program. It presented details of the purpose of the courseware, followed by a series of instructions on how to operate the program. These instructions included a detailed description of the editing keys needed to edit the passages correctly. The Appendix gives an example of these instructions.

Option two carried out initialization procedures by creating a student progress file and student response file.

Option three read the progress file and determined the module the student should be working on.

The fourth option allowed the student to end the CAI session.

The student had to meet the mastery criterion for each section

before moving on to the next module. (S)he was able to end a session
at any time by pressing "q" whenever asked to "Press Any Key To
Continue". The next time the student ran the program it would then
return to the module, on which (s)he had last been working, provided
that option three from the main menu was chosen.

The main theme of the simulation was that the student had just
been hired by the firm of Faber and Faber, and had to work his/her way
up by correctly punctuating a number of paragraphs. In each module, a
different scenario was given which represented various real world
occurrences. For example, the student was told to prepare a report for
the Vice-President of the company. The paragraphs then presented on
the screen represented those from the student's report and (s)he had
to correct them.

An example of what the student was told is:

                    GOOD

    You are certainly doing very well. You have been promoted
    to the position of special adviser to Mr. Faber Jr.,
    the son of the company president. In this new position
    you will be responsible for all outgoing company
    correspondence.

    This means that whatever you pass along will reflect on
    the credibility of your company. If there are mistakes in
    punctuation it will make your company look poor against
    your competitors. You must be very careful as you work.

    The work that will be passed to you may have commas in
    the wrong places or there may be commas missing. It will
    be up to you to decide where to put commas or where to
    take them out.

    Remember Mr. Faber will be examining everything that
    you pass on to him. Since he is the son of the president
    you will want to do the best job possible.

To be promoted in the company, the student had to meet mastery criteria for the section on which (s)he was working. This meant that it was necessary to correctly punctuate two passages in a row.

The courseware employed complete paragaphs rather than single sentences for two reasons. The use of paragraphs rather than sentences gave the student a more realistic assignment. At the same time, the paragraphs gave the student more context with which to better evaluate where to put the commas or semicolons.

The courseware had an editor written into it. This allowed the student to use the cursor control keys to move the cursor to the position where (s)he wanted to enter or delete a punctuation mark. The student could then delete a mark by pressing the delete key. A comma or semicolon was added simply by moving the cursor to where it was to be inserted and then pressing the corresponding key.

The experimenter considered that the use of an editor would improve student learning because it forced the student to interact with the material more.

Much of the courseware previewed (such as that on the Plato system) employed a multiple choice response format where the student had to select the one correctly (or incorrectly) punctuated sentence from the list of four or five sentences presented. The method used in these other programs was considered artifical because it was too far removed from the actual task the student would be doing when correcting his/her own work.

The present study attempted to present a more realistic task,

that would force the student to better learn the skills needed to be successful with his/her own writing later on. By making the student actually correct the paragaphs, the courseware was designed to improve proofreading and editing skills.

In the first two modules, the student was required only to insert missing commas into the text. However, the next two modules required both the insertion of missing commas and the deletion of commas that were in the wrong place. In the last module it was necessary to insert semicolons in the correct place. The amount of actual changes needed for each passage varied from a mininium of two to a maximium of six.

As already indicated, each module of the system was dedicated to only one rule of the comma or semicolon. This approach was taken to make it easier for the student to learn one application of the comma or semicolon at a time. Most English textbooks use the same approach.

Before a student could progress to the next module, (s)he had to first deduce what rule had been used to punctuate the passages correctly. A list of four rules was presented and the student had to pick the one considered to be correct. If the correct rule was selected, that rule was restated on the screen to reinforce the learning. Then the student was moved to the next module. If the correct rule was not selected, it was presented to the student in more detail.

This strategy of requiring the student to deduce the rule, rather than just presenting it, was chosen because it forced the student to think more about the editing processes used.

The first time the student punctuated a passage incorrectly (s)he was told it was wrong and the same passage was displayed again for editing. If (s)he was wrong the second time, a hint was given. It took the form of help from fellow employees or from a supervisor. Some aspect of the present rule being taught was discussed, in the hint, without giving complete details of the rule. If the passage was punctuated incorrectly a third time, then the correct version was shown to the student, following which the next paragraph was displayed for editing.

If the student went through all the passages provided for that particular module without reaching mastery criterion, the rule was stated. The program then indicated that the student had been given another chance, and (s)he was then put through the module again.

Once the student had been presented with the rule and was ready to move to the next module, the program recorded in the progress file the number of the module just completed. At the same time, the number of times passages were not punctuated correctly on the first, second, and third try were added to the response file. Also, each response the student made on a particular passage was recorded.

Each of the five modules followed the same format. The student had to reach mastery criterion in each module before moving on. Therefore, the remediation was given through forcing the student to repeat the module if (s)he failed to reach mastery criterion before the end of the data for that particular module. Each module consisted of six different paragraphs. Since each passage was at least three

sentences long, it was decided that there would be enough passages to hold the student's interest.

The courseware was designed so that there was only one program written in BASICA for the IBM-PC with 128K of memory. All of the data for each module were read from files on the diskette. Each module had four data files that pertained to it. The files all had the same names: only the number on the end was changed to indicate what module it belonged to. The four files were:

1) Scenario data

2) Passages to punctuate

3) Hints when errors occurred

4) The Rule

The first file contained the text that would be printed on the screen, to present the student with an introduction for that particular module. The second file contained the passages that the student would be correcting and the corresponding correct passages, to which the program compared the student's answer. The hint file had the various hints that were presented to the student if errors were made in the same passage twice. The final file contained the rules that the student had to deduce. These were printed at the end of the module.

The management program presented the main menu, retrieved the appropriate files, and recorded a student's progress and responses. It took up 12K of diskette storage. Each of the five modules had four data files that took up, on the average, 8K per module. There was one additional file which had all the instructions for Option 1 of the

main menu. The total courseware package took up approximately 52K of diskette storage. The student's file averaged, on the whole, about 20K, so that the system could fit efficiently on one single-sided 160K floppy diskette.

The programs were written to be completely interactive and special care was taken to ensure that the screen was used effectively. A main menu was incorporated into the program to make it as user friendly as possible. Also special attention was given to ensure the text was centered on the screen at all times. A special border was designed and was always on the screen. Therefore, the text was framed in this border and was easily read by the student.

Content for the business modules was made up of passages that were similiar to those used in memos, business letters, or business reports. Examples of passages in one of these data files were presented earlier.

The academic modules were essentially the same as the business modules except the files containing the paragraphs the student had to punctuate were different. These files were rewritten with passages that were similar to those found in more academic writing such as essays. The kind of subjects they were about were also of a more abstract nature and were less representative of what these students would be accustomed to in their studies. Examples of the passages in one of these data files were given earlier.

Hardware

The computer used for this study was an IBM-PC with 128K of RAM, two single-sided 160K disk drives, and a monochrome monitor. There were twenty such microcomputers made available for this study at the post secondary institute at which the study was conducted. They were housed in a special microcomputer lab and access was, for the times of the training sessions, restricted to the students taking part in the study.

Computer output was displayed on a 12 inch monochrome monitor. A standard IBM PC keyboard was used for input. This keyboard had special cursor control keys and function keys such as "END", "INS", and "DEL", which were activated by the program to allow the learner to edit the various passages presented.

The programs were written in BASICA.

The student's progress and individual responses on each passage were stored in two separate files on a floppy disk.

CHAPTER IV

THE EXPERIMENT

Introduction

The purpose of the study was to determine the effectiveness of Computer Assisted Instruction (CAI) in the teaching of college level English. An experiment was designed to test the courseware that had been developed.

Design of the Experiment

Three randomly selected groups from a local post secondary technical institute were employed in the study.

In order to determine the effectiveness of the CAI programs, it was necessary to have a comparison group which received no CAI instruction. This group, which was referred to as the Control Group, received "traditional" instruction, as described earlier, in a classroom setting.

To test the effectiveness of the two kinds of CAI content, it was necessary to have two treatment groups. Each of these treatment groups received instruction from one of the two parallel programs. These programs were the same in instructional design; they only differed in the kind of passages the student was required to punctuate.

The students in one treatment group received courseware that had passages with academic related content. This group was referred to as Treatment Group A. The second treatment group received courseware that

had passages with business-related content. This group was referred to as Treatment Group B. Examples of the different content are given in the previous chapter.

The control group received instruction of a fixed duration. The students in the two experimental groups were permitted to leave the experiment when they had completed all the modules of the courseware. A strict record of the amount of time each student needed to complete the courseware was kept. The time taken was then used as an additional variable for comparing the two treatment groups.

Sample

The study was carried out at a local private technical institute. The students at the institute were enrolled in a six semester program which lead to a diploma in 'Computer Science in Business'. The diploma program required all students to take a Business English course which was offered to each student in the third semester.

There were approximately 120 third semester students who were randomly placed in four different classes. Each class had approximately the same distribution of male and female students and the demonstrated achievement levels for the four classes were equal. The number of students in each class varied from 30 to 35. The age of the students ranged from 18 to 25.

The sample was comprised of 58 students. One of the four classes was chosen at random, by a table of random numbers, to act as the Control Group. This class consisted of 30 students, of which 5 students were eliminated due to absences. A second class, also chosen

at random by a table of random numbers, was used to create the two
treatment groups. Seventeen students were randomly chosen from this
class to be part of the Treatment Group A (receiving academic
courseware). The second treatment group, Treatment Group B, receiving
the business courseware, consisted of the 16 remaining students from
the original class of 33.

Measuring Instruments

To test the effectiveness of the courseware it was necessary to
use measuring instruments for both achievement and attitude change.

Achievement Tests

Since there were no standardized tests available at the institute
involved which measured the specific objectives taught by the
courseware, the experimenter had to develop the achievement test that
was administered as the pre- and post-test. The content validity for
the test was ensured through consultation with three other teachers of
Business English at the institute.

The instrument consisted of thirty sentences that had to be
correctly punctuated with the necessary commas and semicolons. The
test was given to the students both before and after the treatment
sessions and served as the pre- and post-test. The test required only
semicolons and commas to be added to the sentences, and one mark was
assigned for each punctuation mark that had to be added. This method
of scoring was consistent with other punctuation tests used at the

institution. The highest score possible was 44.

The test was constructed in such a way that there were six sentences corresponding to each of the five rules covered in the courseware. The total marks available for each sentence varied from one to three.

Attitude Measures

There were three attitude measures used in the study.

The first consisted of a semantic differential measure as developed by Osgood to measure connotative meaning. The test consists of a "concept", followed by pairs of adjectives that are opposite in meaning. The subject is required to rate the concept using a number of seven point scales defined by the adjective pairs.

Osgood et al (1957) found that such bi-polar adjectives may be considered to measure three main factors. These factors have been referred to as 'evaluation', 'potency' and 'activity'. The last two factors have sometimes been combined to form a single factor called 'dynamism'. The first factor has been used to measure a subject's approval or disapproval of the concept to which the adjectives are applied (Hallworth and Waite, 1963). In effect, the evaluative factor has been found to be a good measure of a subject's general attitude towards a concept (Hallworth and Waite, ibid).

The measuring instrument for attitude employed in the present study was a semantic differential test based on the 'School Subject Attitude Scales' used by Alberta Education (Nyberg & Clarke, 1983). The test consisted of twenty-four bi-polar adjective pairs which were

defined on seven point scales. The initial group of eight represented

the 'evaluative' factor. However, the other sixteen pairs were also

included to distract the subjects from the main objective of the test.

The adjective pairs were evenly distributed so that half the positive

adjectives appeared on the right and half appeared on the left. An

example of the semantic differential used is given in Appendix. The

scoring of the test was consistent with that specified by Nyberg and

Clarke (Nyberg & Clark, 1983).

Two concepts were rated by the students on the semantic

differential test. These were "Computer Assisted Instruction" and

"Learning Punctuation by Computer". The instrument was administered to

all three groups both before (Pre-test) and after (Post-test) the

treatment sessions.

The second attitude measure consisted of a sentence writing task.

The students in all three groups had to write three separate sentences

to describe their feelings towards three topics specified by the

experimenter, as shown in Appendix. The students' sentences were

then marked by an independent and experienced evaluator. A three point

scale was used where a score of 'one' represented a negative response,

a score of 'two' represented a neutral response, and a score of

'three' represented a positive response.

The students in the two treatment groups were also required to

write a paragraph describing their impressions of learning punctuation

from the computer. Comments that concerned the students' general

impressions of their CAI experience were extracted from the

paragraphs. This task was the third measure of attitude used.

An example of the sentence writing and paragraph writing tests is given in the Appendix.

Administration

The students in the two treatment groups received their instruction from the CAI programs only. The students in the control group received traditional classroom instruction as previously described.

The CAI instruction was administered in two one-hour sessions. The students were given a handout (see Appendix) which detailed how to begin the program as well as other general instruction they would need. They were also given a brief tutorial by the experimenter on how to use the IBM PC.

Since only twenty students could be accommodated at one time, four treatment times were established and each student was asked to attend two of them. The other half of the class which did not attend the CAI sessions were given a regular class lecture on uses of the colon, parenthesis, and dash.

During the second hour, students were allowed to leave when they had completed the punctuation courseware. The time when each student left was recorded. The average time for students to complete the modules was one hour and twenty-five minutes. All students were able to finish the five modules within two hours and ten minutes.

The control group was given classroom instruction covering the same topics. The time spent on this content was two hours.

Hypotheses

The main objectives of this research were to determine:

First, did each of the groups, in fact, learn about uses of the comma and semicolon?

Second, did each of the computer simulation groups learn more than the traditional instruction group?

Third, did either of the CAI groups learn more than the other?

A further objective of the study was to discover whether exposure to the CAI programs had a positive effect on the students' attitudes towards CAI.

These objectives may be formulated as null hypotheses as follows:

Main Hypotheses

1) There will be no differences between the means of the pre-test scores for the achievment test and the means of the post-test scores for the achievement test for each of the three groups.

2) There will be no differences in the amount of change in achievement scores between students who received CAI instruction containing business content, those who received CAI instruction containing academic content, and those who received traditional instruction.

3) There will be no differences in the amount of change in attitude toward computer assisted instruction and learning punctuation by computer between subjects who received CAI instruction containing business content, those who received CAI instruction containing

academic content, and those who received traditional instruction.

Secondary Hypothesis

There will be no difference between the two treatment groups on the amount of time required to complete the CAI programs.

The data collected from the three groups were used to determine whether to reject or accept the above hypotheses. The statistical analyses are discussed in the next chapter.

CHAPTER V

STATISTICAL ANALYSIS OF RESULTS

The data collected were analysed statistically with the aid of the Statistical Package for the Social Sciences (SPSS) and the BMDP statistical program as installed on the Honeywell Multics system at the University of Calgary. The randomization tests were performed by programs written in compiled BASIC on the VAX 750 mini-computer in the Faculty of Eduction Computer Applications Unit at the University of Calgary. A probability level of .05 was used for all data analysis in the study.

Analysis of Data

To test the hypotheses, t-tests were performed on the achievement test and attitude tests scores for each group. Because of the nature of the data, it was not certain that the assumption of normality could be made. Therefore, randomization tests were performed to determine if the results indicated by the t-values obtained would be confirmed. The randomization test compares all the different data arrangements that can be created by interchanging scores between two groups (Edgington, 1980).

The results of the randomization tests verified the significance of the t-values. Since it was not possible to complete all possible permutations, a limit of 100,000 was used.

Table 1 shows the means and standard deviations for each of the

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Table 1

Means and Standard Deviations on Achievement and Attitude
Measures by Group

Group	Pre-test		Post-test	
	X̄	S.D.	X̄	S.D.
Treatment A (Academic Content)				
Achievement	23.94	6.91	29.94	9.10
Attit. (Eval) CAI	43.27	6.45	44.27	7.15
Attit. (Eval) LPC*	37.20	7.85	42.00	8.92
Time (Minutes)**			107.50	19.75
Treatment B (Business Content)				
Achievement	25.44	4.41	35.38	3.16
Attit. (Eval) CAI	40.87	6.14	38.87	10.51
Attit. (Eval) LPC*	37.45	7.79	38.73	9.26
Time (Minutes)**			95.00	13.00
Control				
Achievement	21.88	7.02	31.04	8.84
Attit. (Eval) CAI	42.39	8.62	30.11	20.83
Attit. (Eval) LPC*	38.32	9.51	29.86	20.83

n(Treatment A) = 17; n(Treatment B) = 16
n(Control) = 25

* Learning Punctuation by Computer

** Time taken to complete CAI programs

three groups on the achievement and attitude measures. Figures 1 to 3 also show the differences between pre- and post-test scores for all three groups on the achievement and attitude measures.

Achievement Measure

All three groups showed improvement from their pre-test scores to their post-test scores on the achievement test (see Figure 1).

The results of the t-tests on the pre- and post-test achievement scores within groups are displayed in Table 3 on page 55. There was significant improvement in the scores on the achievement test for Treatment group A (t = -3.10; df = 16; ,p = .007), Treatment Group B (t = -8.73; df = 15; p < .001) and the Control Group (t = -5.19; df = 24; p < .001).

Hypothesis one, which stated that for each group there would be no significant difference in achievement scores from the pre-test to the post-test is therefore rejected, and it is concluded that the CAI program and the traditional instruction were both successful in improving the students' performance.

The post-test scores for each group on the achievement test were compared. The resulting t-test values for each comparison are reported in Table 4. The two treatment groups differed significantly from one another on the post-test (t = -2.25; df = 31; p = .032). This indicates that the students receiving the business content showed significantly greater improvement than did those receiving the academic content.
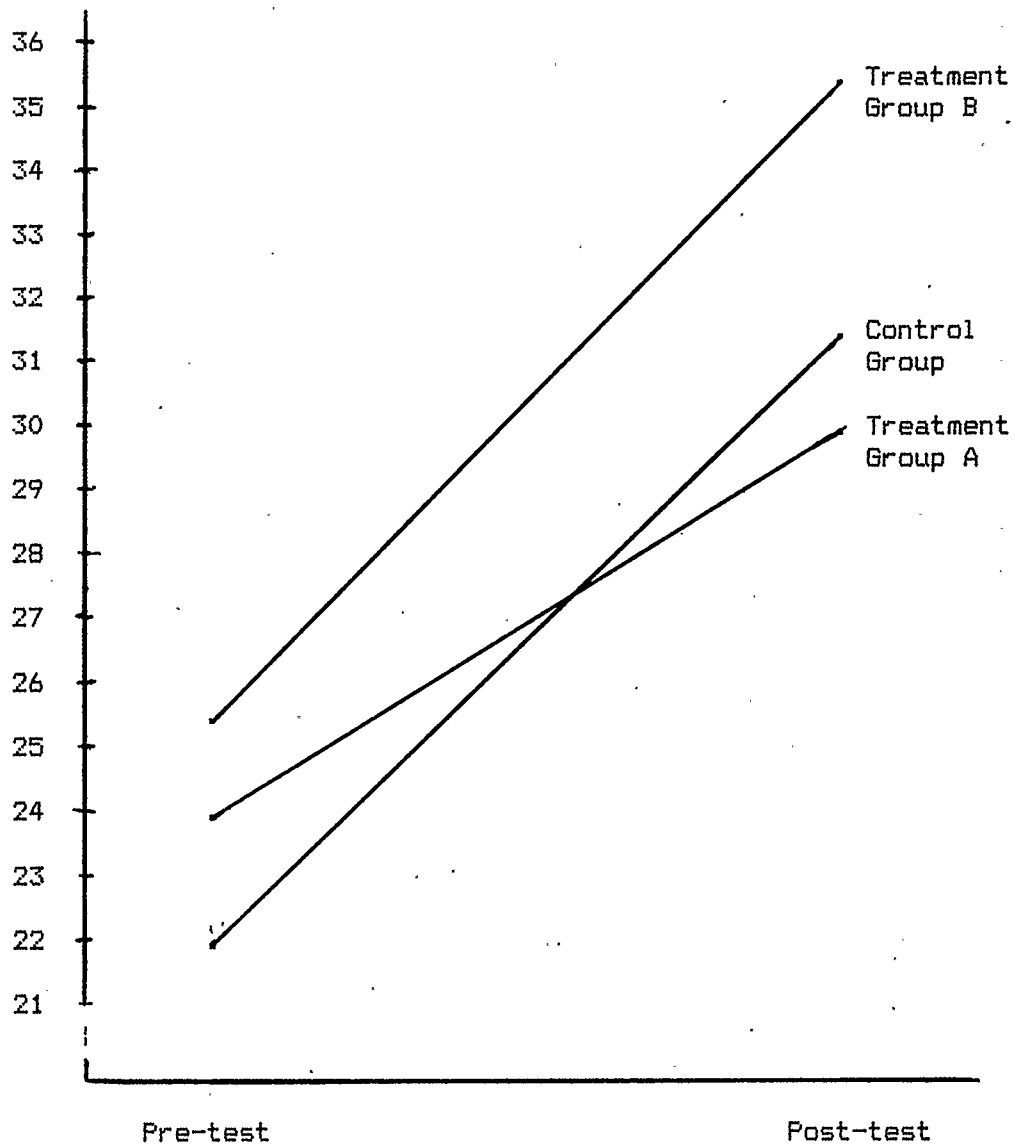
Figure 1.

Mean Pre- and Post-test Achievement Scores by Group

Treatment Group A   (CAI with Academic Content)
Treatment Group B   (CAI with Business Content)
Control Group   (Traditional Instruction)
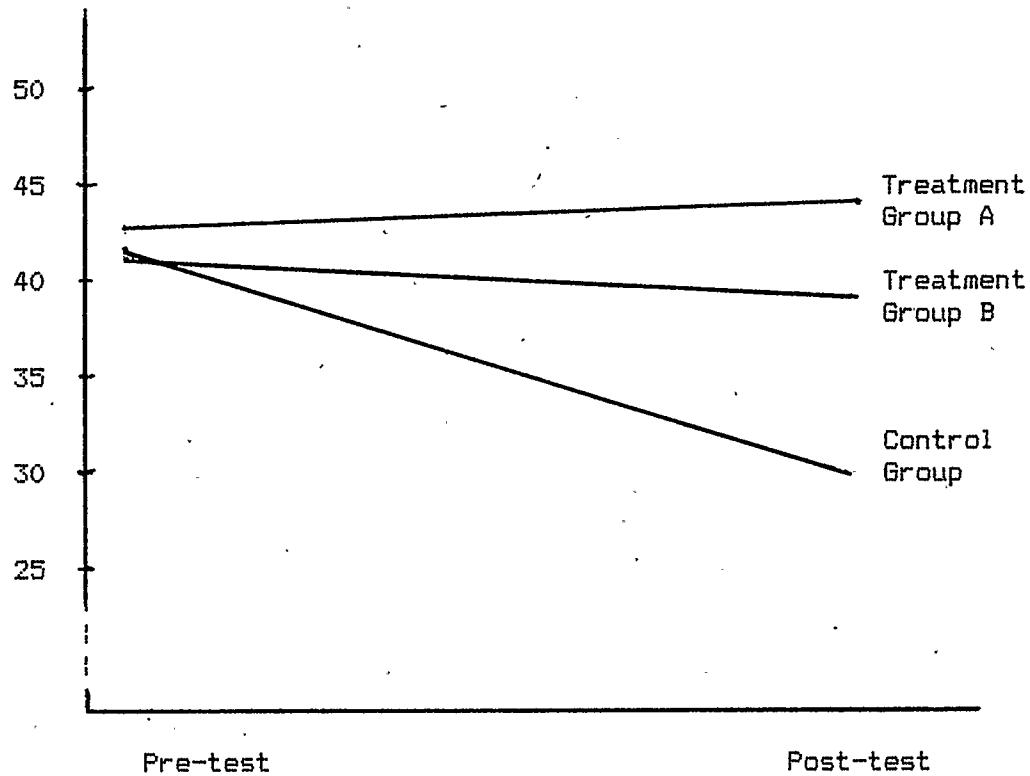
Figure 2.

Mean Pre- and Post-test 'Computer Assisted Instruction'
Attitude (Evaluative) Scores by Group

Treatment Group A (CAI with Academic Content)
Treatment Group B (CAI with Business Content)
Control Group   (Traditional Instruction)
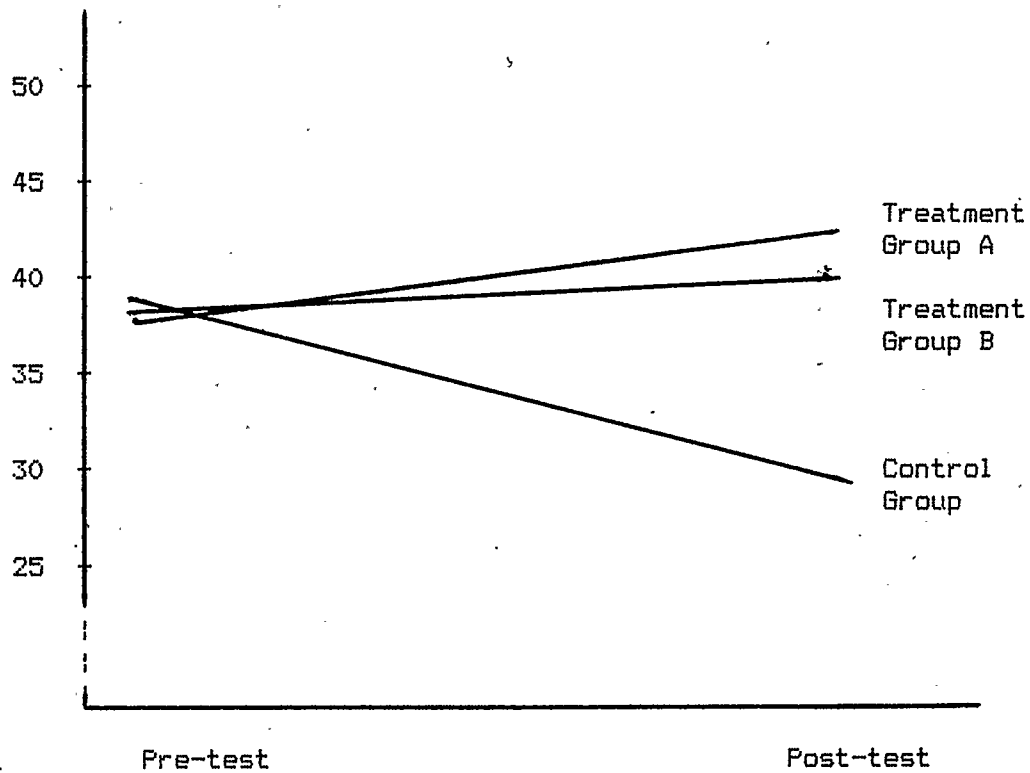
Figure 3.

Mean Pre- and Post-test 'Learning Punctuation by Computer'
Attitude (Evaluative) Scores by Group

Treatment Group A (CAI with Academic Content)
Treatment Group B (CAI with Business Content)
Control Group   (Traditional Instruction)

Table 2

Comparsion of Groups on Pre-test Achievement Scores

| Groups	t - value	df	Prob.
Treatment A and Treatment B	-0.74	31	NS
Treatment A and Control	0.94	40	NS
Treatment B and Control	1.81	39	NS

Table 3

Comparison of Pre- and Post-test Scores on
The Achievement Test

Group   t-value   df   Prob.

Treatment A   -3.10   16   .007

Treatment B   -8.73   15   <.001

Control   -5.19   24   <.001

Table 4

Comparison of Groups On Post-Test (Achievement)

Groups	t - value	df	Prob.	Rand. Prob. *
Treatment A and Treatment B	-2.25	31	.032	.024
Treatment A and Control	-0.39	40	NS	
Treatment B and Control	2.24	39	.032	.0401

* Probability obtained for Randomization Test.

No significant difference was found between Treatment A and the Control Group on the achievement post-test (t = -0.39; df = 40; p>.05). There was, however, a significant difference between Treatment Group B and the Control group (t = 2.24; df = 39; p = .032).

·In light of this analysis, Hypothesis 2, that there would be no differences between the means of the achievement post-test scores for the three groups, is rejected for the comparison of Treatment Group B with both Treatment Group A and the Control group. These results indicate that the students in Treatment Group B made a significantly greater improvement in achievement than the students in either Treatment Group A or the Control group.

Attitude Measures

Figures 2 and 3, on pages 52 and 53, show the means for each group on the two attitude scores for the pre- and post-test. Figure 2 shows that on the semantic differential test for the concept 'Computer Assisted Instruction (CAI)' the two treatment groups stayed about the same while the Control Group's mean decreased considerably over time.

Figure 3 illustrates that although the means for each of the three groups on the semantic differential measure for the concept 'Learning Punctuation by Computer' were all fairly close on the pre-test, the means for Treatment Group A and Treatment Group B on the post-test semantic differential increased slightly while the Control group's decreased from their pre-test level.

Therefore, the attitude of the students in the two treatment groups towards the concepts of 'Computer Assisted Instruction' and

'Learning Punctuation by Computer' remained approximately the same,. while in the Control Group they decreased, although not significantly.

The t-values for the pre- to post-test scores on the semantic differential for the concept Computer Assisted Instruction (CAI) are displayed in Table 5. Neither treatment group showed a significant change in attitude towards the concept of CAI. For Treatment Group A, the t-value was -0.49 with df = 14 and p was not significant. The t-value for Treatment Group B was 0.91 with df = 14 and p was not significant.

The Control Group did show a negative change in attitude toward the concept of CAI (t-value = 0.94; df = 27; p was not significant). However, this negative change was not significant. This indicates that there was only a trend for the Control Group to show a negative attitude change toward the concept of CAI.

Therefore, the hypothesis that there would be no significant difference between the pre- and post-test attitude scores for the three groups on the concept of CAI is accepted.

For all three groups there was no significant change from the pre-test to the post-test on their attitude score for the concept of 'Learning Punctuation by Computer' (see Table 6). The t-value for Treatment Group A was -1.92, df = 14 and p was not significant. Treatment Group B had a t-value = -0.61, df = 14, and p was not significant. For the Control Group the t-value was 1.87, df = 27, and p was not significant.

Table 5

Comparison of Pre- and Post-test Semantic Differential
Scores for the Concept 'Computer Assisted Instruction'

Groups	t-value	df	Prob.
Treatment A	-0.49	14	NS
Treatment B	0.91	14	NS
Control	0.94	27	NS

Table 6

Comparison of Pre- and Post-test Semantic Differential Scores for the Concept 'Learning Punctuation by Computer'

However, it should also be noted that the change for the Treatment Group A was in the positive direction while for the Control Group it was in a negative direction. The hypothesis that there would be no significant difference between the pre- and the post-test Attitude Scores for the three groups on the concept of LPC (Learning Punctuation by Computer) is accepted.

Although no significant difference was found at the .05 level, it may be noted that for both Treatment Group A and the Control Group the amount of change was close to significant.

The t-values for comparisons of the mean post-test semantic differential scores, for all groups and for both concepts, are given in Tables 7 and 8. No significant difference was found between any of the three groups for either 'CAI' or 'Learning Punctuation by Computer'. Therefore, Hypothesis 3, that there would be no difference between the three groups in their attitude toward 'CAI' and 'Learning Punctuation by Computer' after the treatment sessions, is accepted. This means that the treatment sessions were not successful in improving the students' attitudes towards either CAI or 'Learning Punctuation by Computer'. However, a trend for the Control Group to show a decrease in attitude toward both concepts was observed.

Time

The result of the t-test on the means of the amount of time the subjects took to complete the program is shown in Table 9. The t-value for this analysis was found to be significant (t-value = 2.11; df = 30; p = .043). This significant difference was verified by the

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Table 7

Comparison of Groups on Post-test Semantic Differential Scores
for The Concept 'Computer Assisted Instruction'

Groups	t - value	df	Prob.
Treatment A and Treatment B	1.65	28	NS
Treatment A and Control	-0.75	41	NS
Treatment B and Control	1.83	41	NS

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administration of the randomization test (p=.049). Therefore, the secondary hypothesis that the treatment groups would not differ in terms of time needed to complete the programs is rejected. This result indicates that the students who used the program with business content completed the CAI sessions significantly faster than the students who used the program with academic content.

Sentence Comments

As already indicated (page 44), students' responses to each of the three questions to which they gave free-form answers were evaluated by an impartial evaluator. Chi-square tests were then performed on the nominal scores so obtained, using contingency tables. The results are shown in Table 10.

The three groups did not differ significantly in the way they felt about questions one and two. However, they did differ significantly on how they answered the third question (see Appendix), (Chi-square = 9.629930; df = 4; p = 0.05). The difference indicates that the students in the two experimental groups found the CAI sessions a more positive experience. This result indicates that the courseware had some positive effect on the students' attitude towards learning punctuation from the computer.

Table 9

Comparison of Treatment Groups on Time Taken To
Complete Programs

Groups	t - value	df	Prob.	Rand. Prob.
Treatment A and Treatment B	2.11	30	.043	.049

Table 10

Chi-Square Values for Student Sentence Answers to
Questions 1 to 3

Question	Chi-Square	df	Prob.
*			
1	5.756	4	NS
**			
2	5.2728	4	NS
***			
3	9.629	4	.05

*   Question 1 is: "How do you feel about computers?"

**   Question 2 is: "Do you like or dislike using computers to
learn about punctuation?"

*** Question 3 is: "Would you like to learn more subjects using
Computer Assisted Instruction?"

CHAPTER VI

DISCUSSION

Introduction

The main purpose of this study was to discover if CAI was an effective method for teaching some English skills to college level students. Simulation courseware to teach the use of the comma and the semicolon was written and tested.

Two separate CAI simulation programs were developed. One program employed passages that contained business content. The second contained passages with academic content. The two programs were compared with each other and with traditional classroom instruction. The subjects used to test these programs were third semester students at a local private institute of technology.

The main aims of the experiment were to determine first, whether the students who were offered CAI would show improvement on the measures of achievement and attitude between a pre- and post-test setting; second, whether this improvement would be greater than the improvement shown by the group receiving traditional instruction; and third, whether the group offered business-orientated content to punctuate would show greater improvement on achievement and attitude than the group given passages with academic content.

A secondary question was also considered. This was to determine if the students who received the business content would finish in less time than the students who received the academic content.

Discussion of Results

Comparison of the pre-test data for both the achievement and attitude measures revealed that there were no significant differences between the three groups on any of these measures. This finding was expected because the students were randomly assigned to each of the three groups.

The Main Hypotheses: Achievement Test

Comparison of the data from the pre- and post- achievement tests showed that for all three groups the scores increased. The results of the t-tests performed on these data indicated that the gains made were significant for all three groups. These findings show that all three groups improved their ability to use the comma and semicolon, for the applications covered, whether the students were taught by traditional or CAI methods.

Since no significant pre-experimental differences in achievement were obtained between the three randomly assigned groups, it was assumed that any difference found on the post-test could be attributed to treatment. The students in Treatment Group B showed significantly greater improvement than those in Treatment Group A. Therefore, although both treatment methods proved successful in increasing a student's punctuation skills, Treatment B (the business content) was significantly more successful than Treatment A (the academic content). It appears, therefore, that use of business content, for this particular group of students, could help to improve their performance.

The students in Treatment Group B also showed significantly greater improvement from the pre-test to the post-test than did the students in the Control Group. However, the students in Treatment Group A did not improve significantly more than the Control Group although they did show slightly greater improvement. It can, therefore, be stated that the CAI program with academic content was at least as successful as traditional instruction.

These results indicate that CAI was as successful as traditional instruction in meeting the instructional objectives of this particular curriculum.

The Main Hypotheses: Semantic Differential Test

The Concept CAI. The differences observed between the pre- and post-test scores on the semantic differential for the concept 'Computer Assisted Instruction' were not significant. Therefore, no improvement in attitude toward CAI was observed for either of the treatment groups. The Control Group, on the other hand, showed a marked decrease in their semantic differential scores for the concept CAI from the pre- to post-test even though these results were not significant on the t-test.

For the post-test scores, the only difference that approached significance was between the Control Group and Treatment Group A. It should be noted, however, that all the students began with fairly positive attitudes towards CAI. This was not entirely unexpected since the students were studying Computer Science in Business at a strictly

computer oriented school. The only novelty for the students in regard to this study was in the use of the micro-computers and in the kinds of programs they were using.

The students in the Control Group showed a tendency toward a decrease in positive attitude which can best be attributed to their not being exposed to the CAI program. The fact that little positive change in attitude occurred for any of the groups is of concern but not totally unanticipated. Little positive gain in attitude can be expected in a few weeks.

However, if this had been a group of computer naive students, the concern would be higher because of the motivational influence the novelty of CAI exposure should bring to the study.

The Concept Learning Punctuation By Computer. No significant improvement in attitude towards the concept of 'Learning Punctuation by Computer' was observed for any of the groups. When the post-test scores were compared, it was found that there was no difference in the semantic differential scores between three groups. The Control Group showed a negative trend in its semantic differential score while the scores for Treatment Groups A and B increased.

The data here seem to indicate that students found the experience of working with the computer to learn punctuation a positive one. The fact that the students using the programs showed a small improvement in attitude towards the concept measured, namely, Learning Punctuation by Computer, indicates that the program was successful in that regard.

The improvement of attitude might have been greater if the students had received more instruction from CAI lessons.

Secondary Hypothesis

The secondary hypothesis was that the students in Treatment Group B would not take less time to complete the CAI programs than the students in Treatment Group A. The analysis of the data indicated that the students in Treatment Group B finished significantly faster than the students in Treatment Group A.

Since there was no observed difference in initial achievement levels between these groups, it may be assumed that any differences in time to complete the programs may be attributed to the programs themselves. Therefore, it can be concluded that the students in Treatment Group A took longer to complete the programs because of the content used in them.

This finding indicates that students may learn English skills not only better, but also faster, when they are presented with assignments that are more closely related to their own writing style or to styles with which they are familiar.

Sentence Description

The analysis of the sentence task data indicated that there was no significant difference between the groups on their responses to question one (see Appendix), and question two. However, there was a significant difference between the groups on their answers to question three.

The first question was answered positively by all three groups. This result was not unanticipated. The students worked with computers every day at school so it was expected that they would have positive feelings toward them.

Although the differences between the groups on the second question were not significant, the students who used the CAI programs made more positive responses than did the students in the Control Group.

The signficant difference found on the third question indicated that the students in the two treatment groups answered this question more positively than did the Control Group. The students found the CAI sessions to be of interest and a positive learning experience, and were willing to try more in the future.

Student Paragraphs

The students in the two experimental groups were also asked to write a paragraph discussing what they thought were the most important things about learning from the computer. An evaluation of these paragraphs produced a number of comments which gave the experimenter additional information on how the students perceived the CAI sessions.

There appeared to be three general themes running through these comments: the computer offered individualized instruction; the computer was perceived as more patient and more human; and the computer was perceived as more objective.

The computer offered individualized instruction

The comments students made indicated that they perceived the

program as giving more rapid feedback:

> "First of all, you are shown immediately, whether you are
> right or wrong; you don't have to wait a few days for your
> results."

> "Learning from the computer allows you to work at your own speed,
> thereby, giving you a better understanding of the subject
> involved. The constant testing that occurs during CAI makes the
> subject more challenging, and therefore, more interesting."

> "The most important thing about learning with the computer is the
> fun in doing it. Secondly, it is probably faster, and not quite as
> boring. Also the computer tells you when you are wrong, and
> learning from your mistakes is one of the best ways to learn."

They perceived the program as giving more variety of assignments:

> "Finally, there is more variety in the assignments."

They felt the program meant better retention of material:

> "In my experience, I feel that what I have learned about the
> comma is better retained due to the fact that mistakes I made
> had to be redone until absolutely correct. I seem to be able to
> remember the rules more clearly."

> "The best thing about learning from computer instruction is that
> you are personally forced to achieve the proper answer. This can
> be frustrating, however, it is also effective".

> "Finally, the computer presents the lesson very clearly which
> makes it easier to learn."

The same students said the computer let you learn at your own pace:

> "You can learn at your own pace. If you have a problem area, you
> can spend more time at it and less time in an area where you
> don't have any problems".

"The computer has all the patience a student requires. The computer's method of teaching you requires complete understanding of a topic before it continues."

"The computer will wait for your response giving you more time to think."

The computer was perceived as more human

This theme is an interesting one because it seems to indicate that the students ordinarily perceive the learning experience as threatening in some manner, while working with the computer gives them a better feeling of self worth. Some representative comments are:

"The computer never thinks you are stupid."

"You are never embarrassed by a wrong answer when using the computer."

The computer was perceived as more objective

This theme indicates that the students found the programs to be fairer than a classroom instructor. It appears, from this comment, that some of the students were less threatened by the programs than by the classroom setting. Many of the students in technical institutions such as that in which the investigation took place have had difficulty with English in the past, and perhaps for that reason they found the programs to be more objective, less emotional, and less condemning than a human instructor. Comments having this theme are:

"I think the most important thing is that the computer judges everyone the same way."

"The program can be more accurate than a teacher."

"The computer can eliminate human emotion that sometimes
interferes with the learning process, on both sides. Also the
computer will be unbiased when marking answers."

Although most of the students' comments are summed up by the
previous points, there are other comments that they made which are
worth noting. Several students made comments about missing the human
contact.

"For learning purposes, I would rather have human communication."

"However, the lack of human contact can be a problem. You can't
ask a computer a question that it isn't programmed to answer. As
stated above, computers, in conjunction with classroom study, can
be a valid learning tool."

These comments would seem to give further credence to the conclusion
that computers cannot completely replace teachers in the classroom.
Many students rely on the human contact to enhance their learning.

Other comments:

Students also made comments that touched on the courseware
design. One student in the group that received the business content
alluded to this:

"The main point to learning this way is the pratical
application it used. We used the punctuation for different
situations from what we would normally be required to do."

Another student remarked that he liked the instructional design
of the program:

"Second, you are given three attempts to complete the
problems. Third, you are given hints and/or the correct
way to solve the problem. Finally, the questions get
progressively harder to improve your skills."

Finally, one student remarked that:

"I think the punctuation programs should start off easier,
as in single sentences to begin with, and then progressing
to paragraphs."

This indicates that some students perhaps did not like the paragraph

method for punctuation.

The students' commmments in the Control Group appeared to be more

random and contained less detail than those for the two experimental

groups. This reflected their lack of experience with the courseware.

Suggestions For Further Research

There are a number of areas that could be suggested for future

research. One area that could be explored further is to compare the

simulation approach to drill and practice or tutorial programs to see

if one is more sucessful than the other for this particular

population.

Another future consideration would be to determine if CAI

programs in this subject area can offer better retention of the

material over a longer period of time.

A further point of interest would be to determine if CAI can

better help the student internalize the editing skills needed to

enable him/her to punctuate consistently.

In conjunction with the last point, a further study could be

conducted to determine if use of students' own written material would

be even better for improving their writing skills. Also, it would be

interesting to determine whether writing out the sentences would be even better than simply inserting and deleting the punctuation marks.

Finally, consideration could be given to determining whether multiple choice input or editing input (inserting and deleting punctation marks) is the better method for teaching this curriculum.

Limitations of the Study

It is not possible to say whether the programs would have been as successful if they had been compared to individualized tutorials that are used at other post secondary institutions in the community.

Another limitation of the study was that the courseware followed the accepted punctation style and did not leave room for students' different writing styles.

Since the sample consisted of two classes drawn randomly from four third term classes at one institute, the findings can not be generalized beyond this population.

Advantages And Disadvantages of Using Microcomputers

The fact that the students worked on microcomputers rather than minicomputers or mainframes presented some problems as well as advantages. The main problem was in the filing and maintaining of each student's diskette. Since the programs were written with a number of files (20 in total) the user needed the diskette in the machine most of the time. This meant that 20 diskettes had to be stored and organized from one session to another.

However, the microcomputer also contributed some important advantages to the study. One advantage was the lack of system originated downtime problems. Another was the quickness of user orientation to the program, for despite the students' lack of experience on microcomputers the majority of them were able to work comfortably with the program in a matter of minutes. A third advantage was that the speed of computer interaction with the student was not affected by the number of users involved since these were single user systems.

Conclusions

As indicated in the discussion of the limitations of the study, the findings should not be generalized beyond the four classes that formed the population from which the sample was selected. However, the present computer institute for young adults may be considered comparable to many other such institutes, and to many business education colleges. The findings may therefore be assumed to indicate useful directions for further research and practice.

The study has shown that CAI was successful, for the students involved in this experiment, in teaching a small part of the college English curriculum. Since many students at a computer school are more motivated to learn from the computer, it may be advisable to introduce more CAI into their English courses.

The study also showed that a simulation program could be employed to teach English. The literature has indicated the general limitations

of drill and practice and tutorial programs in the teaching of college level English. It would seem from the present findings, then, that more studies should consider simulations as an instructional stategy with college level English students.

A further finding was that the type of content used in passages the students must correct also affected the success of the courseware used. It appears, therefore, that more care must be taken in the future with regard to the kind of content used in CAI programs. It is not enough to simply write programs with good instructional strategies. In the area of college English, at least, it is very important that an appropriate kind of content is employed in the CAI programs used.

The general success of this study indicates that CAI may be a viable way of offering individualized English instruction at the present institution. It is too early to say whether CAI could be an effective method of instruction in other parts of the college English curricula. However, the present results are encouraging for future investigations.

Although there were no significant gains made in students' attitudes, it was observed that the Control Group's attitudes dropped over the duration of the study while the two experimental groups' attitudes stayed the same.

Finally, the use of CAI to teach English at a computer college

may be a way to help students connect the computer to other aspects in
their lives besides programming.

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APPENDIX

THE ACHIEVEMENT AND ATTITUDE TESTS
AND INSTRUCTIONS GIVEN TO STUDENTS

Pre- and Post-Achievement Test

NAME:

CLASS:

Punctuate the following sentences with the necessary commas and semicolons:

1. The insurance policies Numbers 401768 and 401769 which were typed yesterday should be mailed today.

2. Have you had chicken pox mumps or measles?

3. We enjoyed working for Mrs. Brown was a wonderful boss.

4. Tammy wanted to frost her hair yet she was afraid the process might give her split ends.

5. We could not help them much with the party preparations nor did they expect us to.

6. Except for these cats don't appeal to me.

7. Yes the computer language Cobol is used extensively in our company.

8. On our trip we visited three capitals: Austin, in the heart of Texas Denver, high in Colorado and Oklahoma City with the oil wells.

9. The moose is very like the deer its horns drop off when the spring is near.

10. He needs a transfusion not a vacation to perk him up.

11. They had a verbal agreement he insisted this agreement should also be stipulated in the written contract.

12. Mike and Sherry Bill and Pauline and Rebecca and Robert will all be at the party tonight.

13. China is a huge nation and it contains many different ethnic and language groups.

14. He logged onto the computer did his program and logged off.

15. After dark mosquitoes nearly ate us alive.

16. Doubting while I hoped I asked myself if I had really got the job.

17. The advent of word processing equipment has made the typist's job more challenging varied and interesting.

18. Most people's financial problems are simple they are short of money.

19. This computer the best on the market is very expensive.

20. Your notes from class not the textbook will help you most in reviewing for the exam.

21. He trimmed the shrubbery very carefully for he hoped to keep the hedge alive for the whole summer.

22. As you may already know understanding the uses of the comma is very important to a writer.

23. He is I am sure an excellent system analyst.

24. Fresh air the sight of green grass and good country food perked me up quickly.

25. I spent time studying yesterday that's what I do when I can not get into the computer lab.

26. The crown of thorns a member of the cactus family grows well in Florida.

27. She had to appear extremely competent and knowledgable or she would not get the new position.

28. The airport facilities included hangars a large landing strip with taxiways and a restaurant bar.

29. The IBM PC is a microcomputer it is used in many businesses now.

30. Before victory was assured the candidate shook hundreds of hands and kissed hundreds of babies.

Semantic Differentiation Measure

NAME:

This questionaire is designed to measure your feelings about some words.

You will be given a list of adjective pairs that will describe other words. Please place a check mark in one of the set of brackets ( ) between each adjective pair. The closer your mark is to an adjective, the stronger your feeling towards the way that adjective describes the word(s).

Example:

Money

like ( ) ( ) ( ) ( ) ( ) ( ) ( ) dislike

The closer you check to _like_ the more you like money. The closer you check to _dislike_ the more you dislike money.

Please Complete ALL the word pairs.

Computer Assisted Instruction

nice	( )	( )	( )	( )	( )	( )	( )	awful
boring	( )	( )	( )	( )	( )	( )	( )	interesting
unpleasant	( )	( )	( )	( )	( )	( )	( )	pleasant
dislike	( )	( )	( )	( )	( )	( )	( )	like
bright	( )	( )	( )	( )	( )	( )	( )	dull
dead	( )	( )	( )	( )	( )	( )	( )	alive
lively	( )	( )	( )	( )	( )	( )	( )	listless (lazy)
exciting	( )	( )	( )	( )	( )	( )	( )	tiresome
useless	( )	( )	( )	( )	( )	( )	( )	useful
important	( )	( )	( )	( )	( )	( )	( )	unimportant
impractical	( )	( )	( )	( )	( )	( )	( )	practical
worthless	( )	( )	( )	( )	( )	( )	( )	valuable
helpful	( )	( )	( )	( )	( )	( )	( )	unhelpful
unnecessary	( )	( )	( )	( )	( )	( )	( )	necessary
harmful	( )	( )	( )	( )	( )	( )	( )	advantageous
meaningful	( )	( )	( )	( )	( )	( )	( )	meaningless
hard	( )	( )	( )	( )	( )	( )	( )	easy
light	( )	( )	( )	( )	( )	( )	( )	heavy (more work)
clear	( )	( )	( )	( )	( )	( )	( )	confusing
complicated	( )	( )	( )	( )	( )	( )	( )	simple
elementary	( )	( )	( )	( )	( )	( )	( )	advanced
strange	( )	( )	( )	( )	( )	( )	( )	familiar

understandable ( ) ( ) ( ) ( ) ( ) ( ) ( )   puzzling

undemanding   ( ) ( ) ( ) ( ) ( ) ( ) ( )   rigorous
(has to be
exactly right)

Learning Punctuation by Computer

nice	( )	( )	( )	( )	( )	( )	( )	awful
boring	( )	( )	( )	( )	( )	( )	( )	interesting
unpleasant	( )	( )	( )	( )	( )	( )	( )	pleasant
dislike	( )	( )	( )	( )	( )	( )	( )	like
bright	( )	( )	( )	( )	( )	( )	( )	dull
dead	( )	( )	( )	( )	( )	( )	(	alive
lively	( )	( )	( )	( )	( )	( )	( )	listless (lazy)
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                                                  (has to be
                                                   exactly right)

A. Please write one sentence for each of the following topics:

    1) How do you feel about computers?

    2) Do you like or dislike using computers to learn about punctuation?

    3) Would you like to learn more subjects using Computer Assisted Instruction?

B. Please write a paragraph to describe the most important things about learning from the computer.

WELCOME TO OFFICE WRITING SIMULATION

This is a simulation to help you improve your punctuation
skills. The object of the simulation is to try and
progress as far as possible in the company in which you
are working.

You will be given different passages to punctuate. If you
correctly punctuate these passages you will be promoted.
The higher you move up in the company the more you will
need good writing and communication skills, and the
better is your chance of success is if you have them.

EDITING HELP

You will be given a number of paragraphs to edit as you
progress through the program. Here are some tips to make
you task easier.

EDITING INSTRUCTIONS

1) Use the cursor control keys, on the right of
   key board, to move the cursor to where you
   want (left, right, up, down) until you
   position the cursor over the place to add
   or delete a comma or semicolon.

2) To insert a comma or semicolon just type the
   comma key or semicolon key when you have
   positioned the cursor over the place where
   you want the comma or semicolon to appear.
   It will then be placed automatically in the
   text at that point.

EDITING INSTRUCTIONS CONTINUED

3) You can also use the Del (delete key) key
   to delete commas that are in the wrong place.
   The Del key is on the right below the 3 key.
   Find it now for future reference.

4) To insert a space, if you have deleted a
   space by mistake, use the Ins key (Insert
   Key). It is on the right just below the End
   key. Find it now for future reference.

EDITING INSTRUCTIONS CONTINUED

5) To tell the computer you are finished working
   with a particular passage just type the
   End key (located on the right below the
   4 key). Find it now for future reference.

6) Remember the computer will only accept a
   passage as right if all of the commas or
   semicolons are in the right places and the
   passage is unaltered in any other way.

Instructions For Comma Programs

1) Place the diskette in the drive on the left hand side of IBM PC. Make sure the label is facing up and the slot in the diskette is pointed to the back of the disk drive.

2) Flip the red switch on the right side of the IBM PC. You will need to wait about 1 minute before anything happens.

3) A menu will appear with the following options:
   1) Instructions, 2) Begin Simulation First Time,
   3) Continue Simulation, and 4) Quit.
   Choose option 1 by pressing the 1 key. Read all of the instructions carefully as they will explain how to use the cursor keys and the other edit keys. Pay careful attention to the use of the END key.

4) Choose option 2 next. (You do this only the first time you run the program. When you come back for the second session use option 3 instead.).

5) The program will ask for your full name. Type in your first and last name. It will ask you to check to make sure it is spelled right. For the second session it is crucial that you spell it the same way you spelled it the first time or you will find yourself starting at the beginning again.

6) Follow the instructions in the program carefully. Make sure you read each passage closely before you punctuate it. The program will only accept the answer it is programmed to accept. Therefore, no words are to be added or deleted from a passage. The only things you must add or delete are commas or semicolons. The computer is very rigid and if you alter the passage in any other way it will tell you that you have made a mistake.

7) The program deals with only one punctation rule at a time so do not expect to have that many commas to add or subtract at any time. The semicolon is the last section of the program so you only need to add them then.

8 When you want to quit type "q" or "Q" whenever it says to "Press Any Key To Continue". The program will then return to the main menu and you can type option 4 to quit the program. However, it is best to quit the program when you begin the next section or else you will have to repeat the section you are on over again.