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## Efficiency versus Effectiveness: The Teacher Versus the Computer in Classroom Education

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EFFICIENCY VERSUS EFFECTIVENESS:  
THE TEACHER VERSUS THE COMPUTER  
IN CLASSROOM EDUCATION

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A Project  
Presented to  
THE VOCATIONAL EDUCATION DEPARTMENT  
Old Dominion University

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In Partial Fulfillment  
of the Requirements for the Degree  
Master of Science in Education  
VTE 635 RESEARCH PROBLEMS IN VOCATIONAL EDUCATION


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BY  
Juanita V. Smith  
May 1987

A P P R O V A L    P A G E

This research paper was prepared by Juanita V. Smith under the direction of Dr. John Ritz for Vocational and Technical Education 636, Problems in Education. It is being submitted to the Graduate Program Director as partial fulfillment of the requirements for the Degree of Master of Science in Education.

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## CHAPTER I

### INTRODUCTION

Education today is taking many shapes and forms with the increasing use of computers in the classroom. To be considered an educated person today, one must not only be acquainted with computers, but also with what they can accomplish and how they can advance the cause of all humanity as well.

Knowledge required to become computer literate involves understanding the capabilities and limitation of the various machines or hardware that make up a modern computer system; being familiar with some of the more common uses of applications of computers in today's society; and understanding the analysis, design, and program preparation procedures necessary to produce written programs of instructions and use of software. It also involves being aware of how an individual or organization may be affected by present and future computer applications.

There is a school of thought that believes that the computer will eventually replace the teacher as the preferred method of educating tomorrow's children. This is an exploratory study which seeks to establish the

plausibility of such an occurrence.

#### STATEMENT OF THE PROBLEM

The problem of this study was to determine whether the computer is as effective as a teacher in the classroom environment. To answer this problem the researcher will compare the performance of students (enrolled in Business Computer Applications) who are taught Word Processing by teacher-lecture and assistance method with the performance of students taught by a tutorial-computer software method.

#### HYPOTHESES

There is a significant difference in the performance of Business Computer Application students who are taught Word Processing by packaged tutorial software and Business Computer Application students who are taught Word Processing by teacher-assisted method as measured by a Word Processing Unit Test.

#### BACKGROUND AND SIGNIFICANCE

When discussing computers, one might quickly think of a dichotomy, one of hardware and software. Hardware refers to the computer itself and its peripheral devices (disk, drives, printers, etc.); software refers to the programs or instructions which are entered into the computer to make it

perform specific tasks.

The computer is merely a tool, a vehicle, to enable teachers to explore ways of doing things that were not possible before its arrival in the classroom. The researcher perceives it as an aid to instruction. The individual classroom teacher knows best what will work in the classroom environment.

Speed and accuracy are not divorced from the capabilities of the computer's attributes. The computer accepts data, processes it according to specific instructions, and provides the results of new information. Aside from being fast and accurate the computer has the ability to move large quantities of data and store it. The computer is also capable of performing many varied tasks by having the instructions changed.

With the many advantages that allows this piece of equipment to excite the minds of our students, it does not exist without its limitations. This writer will be among the first to admit that the computer is of interest to students, however, it is not a social entity. It can not learn from its own mistakes. And as far as the student/computer relationship is concerned, it is non-existent because the computer does not provide emotional support which provides a student with positive feedback. Computers can be a problem when they are used as



a substitute for a living being, whether teacher or parent. There is just no substitute for human encounter (3, p. 52). Students, teachers, and administrators need to know that computers can not think and are incapable of engaging in other human activities such as feeling, caring, believing, regretting, imagining, crying, forgiving, or loving.

Computers are seen as models of how to think (4, pp. 72-74), however there is value in teacher related activities that are interwoven with thinking, such as desire, intuition, and imagination. There are limitations of the computer which teachers should explain to students. Computers must not be placed on a pedestal--owning a computer will not assure a child the key to a successful life. The key is to create an educational environment with a teacher or trainer as a monitor, in which students can perceive valuable only as technology.

Bellman stated, the computer needs everything spelled out precisely, numerically, and logically. The human mind, for reasons we do not understand at all, can deal with vagueness and ambiguity and thus can cope with every complex system. He further states that, the computer also can not deal with contradictions. The human mind can--with no difficulty whatsoever (1, p. 50). Many have coined the computer as a "timesaving" machine, however the computer does lack knowledge concerning its capabilities.

To sum the computer up in a few words, it is a "dumb" machine capable of performing operations as requested by its user.

#### LIMITATIONS OF THE STUDY

According to Martellaro, there are more computers in the classroom than ever before and the potential is there to make the classroom a more imaginative and challenging learning environment with computers (4, p. 27). Although this study will not be concerned with the fact that some teachers feel threatened by computers, it has been reported that some teachers feel the computer will eventually replace them. Others feel that computers dehumanize education because the student is interacting with a machine and not with other students (2, p. 28).

The accessible subjects in the study were intact groups assigned to the researcher's first and second period classes. Therefore, there was no opportunity to randomly select subjects.

#### BASIC ASSUMPTIONS

This research study assumes that as an instructional aid, the computer is challenging established tradition of what constitutes "teaching" in the classroom environment. Additionally it presumes that the computer can not replace

the human element a teacher represents in the classroom.

The two groups have equal ability because the students are enrolled in the general studies tract and have no prior computer experience. These classes are specifically designed for students at the entry level of computer skills.

### PROCEDURES

Subjects for this study were two intact groups from Gloucester High School. Both groups were classified as general studies, thus having equivalent ability levels. One of the prerequisites for the participants in the study was no prior computer experience.

The same teacher taught both groups, but used different teaching approaches with the two groups. The control group was taught by the traditional method and the experimental group was taught by the computer. A post-test was administered to both groups in order to determine the outcomes of their performance.

### DEFINITION OF TERMS

The following terms are used throughout this study. They are listed and defined to aid the readers' comprehension of this project.

1. Hardware - the computer.

2. Word Processing - is the use of the computers to create, view, edit, store, retrieve, and print text material.
3. Software (courseware) - prepared program of a particular application.
4. Diskette - flexible rotating disk.
5. Disk Drive - small box into which a diskette is inserted.
6. Keyboard - used to key in data from source documents.
7. Printer - prints information as instructed to by the computer.
8. Monitor - displays messages or data keyed in on the keyboard.
9. AppleWriter Commands - special codes used to operate word processing program.
10. Powering up - procedure used to turn the computer power on.
11. Master Disk - a disk which holds a particular program of instructions.
12. Initializing - process of cutting sectors onto the disk.
13. Program - a list of instructions that tells the computer to perform a given task.
14. BCA - Business Computer Application: a course taught at Gloucester High School.
15. Teacher-lecture - class taught by the teacher (control group).
16. Tutorial-computer - class taught by computer with the help from software (experimental group).

#### SUMMARY

The purpose of this study was to determine whether the

computer is as effective as a teacher in the classroom. A comparison will be made of the performance of students taught a word processing unit by the teacher with the performance of students taught by tutorial-computer software. Sufficient background information supported by the other sections covered in this chapter indicated that this investigation would be valuable and the results could make a contribution to an already existing body of knowledge in this area.

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## CHAPTER II

### REVIEW OF RELATED LITERATURE

#### INTRODUCTION

Teachers have a number of concerns about computers being used in the classroom. The initial reaction for many teachers has been the fear that a machine could replace them in the learning place. Very often this fear emanates from the mistaken belief that computers are, in some way, intelligent and capable of doing anything at the touch of a button. However, after a brief experience with the computer in the classroom it is a disappointing fact to learn that careful program instructions must be spelled out to get it to perform the most simple tasks. A review of the related literature revealed that computers are used in almost every facet of school operations. There are advantages as well as disadvantages relative to their use. A number of researchers have documented the advantages and disadvantages of this new technology.

#### The Use of Computers in the School

Even though there is now at least one microcomputer in every school, it is a far cry from the

day when they will take over the teachers' jobs (1, p. 8). Using the computer as a teaching aid will not replace the traditional role of the teacher. The computer is to be seen as a teaching and learning resource just like any other. In this review, the emphasis will be placed on the relationship the computer plays in the classroom as reported by various sources in the field.

An article written by B. F. Skinner in the March, 1987 edition of Education Digest reported the invention and use of a "teaching machine" as early as 1926. This was over 50 years ago. The reason for the invention of the teaching machine was to restore two important features of personal instruction. There existed the need for a tool that would satisfy these two goals: (1) provide immediate evaluation simultaneously and (2) provide for progression at an individualized pace (10, p. 12). For we realize that what is done simultaneously by every member of a large group can not be evaluated immediately, and what is taught to a large group can not be precisely what each student is ready just at that moment to learn.

#### Instructional Aid

It should be noted that in all of the sources



examined, none advocated exclusive use of the computer and the eventual elimination of the teacher. Jorde asserted that the computer's role in the schools was that of an instructional aid or device (8, p. 36). The computer then should be viewed by educators as a tool which helps teachers manage instruction more efficiently and effectively. This position was also supported by Campbell (1984), Bundy (1968), Dunlap and Descamps (1985), as well as Uhlig (1982).

As an instructional aid, the computer is challenging established traditions of what constitutes teaching in the classroom environment (6, p. 37). Many believe the computer provides a new kind of interactive medium that helps teachers manage instruction in more individualized ways--thus facilitating students' learning of important concepts (6, p. 38).

As an instructional device, the microcomputer would be used for specific subject tutorials and for drill and practice. According to Uhlig, because the heart of such a program is the software, the most important quality of computer literacy for teachers is to be intelligent consumers or evaluators of software (11, p. 109). This implies that a teacher should be able to operate the hardware and run the software.

### Tutorial Aid

One of the most promising uses of the computer is the role it can play as a tutor for the student. In this mode the computer introduces new concepts, totally new material, or extensions of previous lessons (7, p. 36). Tutorials have many potential uses, however, a plan for a teacher to monitor and support students in these courses should be developed to ensure the success of such a program (7, p. 37).

### Record Keeping Aid

Another excellent use of computers in the classroom was suggested by Uhlig. He suggested that the time teachers spend keeping records could be alleviated with the computer, thereby increasing the amount of time available for instruction and the management and planning of learning (11, p. 109).

### Disadvantages of Computer Use

Among the sources who did not sing the praises of the computer was G. N. Getman. His article entitled "Optometric Problems Caused by Computers in the Classroom," pointed out eye problems associated with classroom computer use. From 30 to 60 percent of children in the usual elementary school are not able to

focus eyes and attend well enough to succeed without extreme stress and/or visual adaptations. Study after study, according to Getman's article, now shows an increase in nearsightedness among American school children. Also noted was the fact that many adults who have already experienced such visual deteriorations are quitting or demanding a change in job assignment (5, p. 56).

Jorde wrote of the growing concerns for physical and psychological consequences of prolonged computer use. See warns that:

Stress reactions to interaction with electronic media over an extended period of time, such as blurry vision and eye strain, fatigue, headaches, and musculoskeletal aches and pains, are serious and need to be understood more fully (7, p. 38).

#### Advantages of the Computer

The speed with which the computer has been plugged into almost every aspect of American life is unprecedented in the history of technological development. As Luehrmann states:

Computing plays such a crucial role in everyday life and in the technological future of this nation that the general public's ignorance of the subject constitutes a national crisis.

The ability to use computers is as basic and necessary to a person's formal education as reading, writing, and arithmetic. As jobs become increasingly

oriented toward the use of information, society demands and rewards individuals who know how to use information systems (8, p. 98).

Computer literacy is fast becoming a basic survival skill in our society. Winkly and Mathews define computer literacy as "whatever a person needs to know about and be able to do with computer in order to function competently in our society" (12, p. 314). Since the school is the main institution for the dissemination of information, it is necessary to include computer literacy as a regular part of that curriculum.

Computers can perform tirelessly and patiently for long hours. Mistakes made by students in a classroom setting can be removed at the press of a key. Text can be manipulated and edited to produce a perfect copy. But what the computer can not do very well is:

- a. replace teachers as caring human beings whose professional knowledge and experience enables them to match students' learning experiences to their needs, abilities and interest.
- b. make decisions for itself without being given precise instructions on what to do (6, p. 11).

It is noteworthy that research indicates that CAI, not computers alone, had significant and positive effects on achievement of students. Morgan (1977) introduced the CAI approach to four arithmetic operations in nine elementary schools in Rockville,

Maryland. The evaluation of the program was conducted by comparing the performance of students with four schools using a traditional approach. All students were given a pre-test and post-test developed especially for the investigation. The test results showed that in each grade level, students using the CAI program made significantly greater improvements than did students in the traditional approach (9, p. 13).

#### Summary

The literature tends to suggest that the computer should never be used as a substitute for the teacher in the classroom. Consequently, the combination of the teacher and the computer can result in a certain synergism that can focus and expand the imagination of students.

Many studies were found that projected the significance of computer assisted learning which prompted this writer to conduct a similar experimental research project that would seek to make some distinction between the pedagogical and technological issues surrounding this very critical aspect of teaching and learning.

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### CHAPTER III

#### METHODS AND PROCEDURES

##### INTRODUCTION

This chapter will outline the procedures followed in conducting the study. Relevant information concerning the population will be reported. An adequate description of the instrument used to collect the data will be provided. And finally an objective and logical analysis of the data as it relates to the hypothesis will be presented.

##### POPULATION

This study will involve two groups of students enrolled in Business Computer Applications at Gloucester High School during the 1986-87 school year. There was a total of 47 students enrolled in the two groups. One group will be taught a unit in word processing using a teacher-lecture approach. The other student group will be taught the same word processing unit using the tutorial-computer software approach. There were 26 in the control group and 21 in the experimental group. The groups comprised of two intact classes. Both groups were classified as general

studies students, thus, having equivalent ability levels. One of the prerequisites for the participants in the study was no prior computer experience.

#### INSTRUMENT

In order to conduct this comparison and demonstrate whether the teacher is more effective in classroom education, both groups will use the same computer systems provided by Gloucester County School Board (Apple IIe); the courseware Applewriter, published by Paul Lutus, Apple Computer, Inc. Each student will have a mini-disk to store this document on for future use. Both groups will prepare a printed copy of a simple report. This report is pre-printed with special instructions (Appendix A). Only one group will be engaged in a series of lectures concerning the word processing unit. The post-test evaluated the subject's performance and to what extent they had comprehended the material presented. The instrument was developed by Paul Lutus and used in two studies. The reliability coefficients of the instrument for these two studies were .86 and .93 respectively. It consisted of a basic objective test format with three parts. A copy of the test is found in Appendix D.

Following the post-experiment testing, the



difference in group means will be determined by use of the t-test.

Each group will participate in a written test at the end of the unit. The teacher-lecture student group will use the computer as a teaching aid while the tutorial computer group will rely solely on instructions from the courseware Applewriter in completing the report.

#### PROCEDURES

In teaching group one, (tutorial-lecture) the teacher will use the master disk (Applewriter) to review the powering up procedure. Also through the use of the master disk, students will follow a demonstration for initializing a blank disk. The teacher will use the chalkboard to define Applewriter commands needed to execute the program. A demonstration of these commands using the computer as a teaching aid will be illustrated after the chalkboard presentation.

Group two will complete the above assignment without the benefit of teacher-lecture or demonstrations. Each student in this group will be taught through the use of the courseware approach. At no time will the teacher interact with the students in

this group.

The students will be administered the Word Processing Test after completion of the unit. The tests will be scored and data organized for analysis.

#### DATA ANALYSIS

The means and standard deviations will be calculated for each group's performance on the post-test. In order to determine if there is a significant difference in the performance of both groups, a t-test will be used.

#### SUMMARY

The subjects in this study are two intact groups of students who enrolled in Business Computer Applications general studies at Gloucester High School. Two treatments were used in teaching a word processing unit. One group was taught traditionally by the teacher and the other group was taught using only the computer software. A post-test was administered to measure the performance and comprehension of both groups. The t-test will be used to determine the significance of both methods.

## CHAPTER IV

### FINDINGS

#### INTRODUCTION

It is generally accepted that the purpose of all experimental research investigators is to generalize their findings and make transfers to other subjects and other situations. He is not interested in limiting his conclusions to only the particular groups used as his subjects. He would like to be able to conclude that such a finding would be reproducible in other settings. In this particular experiment, the findings are quite revealing and justified the effort and energy expended to complete it.

The purpose of this study was to compare the performance of students enrolled in Business Computer Applications who were taught a unit in word processing by teacher-lecture and assistance with the performance of students taught by the tutorial software approach. Forty-seven students were enrolled in the Business Computer Applications course at the time of this experiment. All students were given the same information on a handout to carry out this task. Group one (teacher-lecture method) consisted of 26 students

and group two (tutorial-computer software method) consisted of 21 students.

Group one, with teacher-lecture and assistance, were engaged in class lectures and demonstrations of all Applewriter commands used in completing the WP assignment. Group two engaged in the same process of study except the lecture sections were not delivered. The teacher only answered questions when students could not continue the learning process without an explanation of a particular procedure. The findings of the experiment are as follows (using the assignment WORD PROCESSING: A SIMPLE REPORT): Each group was able to complete the assignment with little difficulty, however group two required more teacher assistance than group one for positioning the paper in the printer, setting margins through the use of the print/program command menu, and explanations of commands to be used. (see Appendix A)

The hypothesis was addressed by calculating the mean scores of the student's Word Processing Test and using the t-test to determine if there was a significant difference in the two means.

The hypothesis stated that there is a significant difference in the performance of Business Computer Application students who are taught Word Processing by

packaged tutorial software and Business Computer Application students who are taught Word Processing by teacher-assisted method as measured by a post-test.

<u>Group 1</u> Teacher	<u>Group 2</u> Tutorial
$N_1 = 26$	$N_2 = 21$
$\bar{X}_1 = 59.88$	$\bar{X}_2 = 50.95$
$S_1 = 18.634$	$S_2 = 22.53$
$S_{\bar{X}_1} = 18.634 \div 26$	$S_{\bar{X}_2} = 22.53 \div 21$
$= 3.65$	$= 4.916$
$S_{\bar{X}_1 \bar{X}_2} = \sqrt{\frac{(3.65)^2 + (4.916)^2}{13.3225 + 24.1671}} = \sqrt{\frac{37.4896}{37.4896}} = 6.123$	
$t = \frac{59.88 - 50.95}{6.123} = \frac{8.93}{6.123} = 1.458$	

Without a total  $N = 47$  we will use the normal curve values of 1.645 (5 percent level) and 2.33 (1 percent level) to determine the significance of the difference. The calculated  $t$  ratio = 1.458 does not exceed 1.645 nor 2.33. Therefore, we can assume that the observed difference between the means is not significant at either the 5% level nor the 1% level of significance. Therefore one would seem justified in failing to reject the claim (null hypothesis) that there is no difference between the two methods of instruction, based upon the sample data.

#### SUMMARY

The hypothesis for this study stated that there would be a significant difference in the performance of the two groups. However, the results indicated that the performance of the two student groups was not significantly different.

## CHAPTER V

### SUMMARY

Two intact groups of Business Computer Application students from Gloucester High School were used to determine the effects of word processing units taught by the teacher verses the computer. At the end of the experiment a post-test was administered to assess the performance and comprehension of the groups.

The means, standard deviations, and differences in the means for both control and experimental groups were computed in order to test the hypothesis. The t-test was used to test the significance of difference between the means obtained for the control and experimental groups.

### CONCLUSIONS

Results of this study showed there was no difference in the performance of the two student groups based upon the teaching methods used. The test scores and the results of the t-test indicated that the students in group one who were taught a Word Processing unit with teacher assistance experienced no significant difference from the students who only used tutorial

software. Therefore, we fail to reject the null hypothesis. The means of the two groups are not significantly different. Consequently these results indicate that the performance of the two student groups on the Word Processing Test was not significantly different.

One factor which might have made a considerable distinction would have been the use of a pre-test in computer knowledge and/or ability. Another factor taken into consideration might have been the amount of time students took to complete the program. One wonders what difference may have been found had sex been taken into account. Perhaps the use of an experimental design which allowed for the use of randomly selected subjects that were subjected to pre-test as well as post-test might have served to draw another set of conclusions.

Students are known to learn at different rates. Some students are financially able to purchase a home computer system which would afford them greater experience. There are also students who are mainstreamed with various handicaps and learning disabilities. All these variables may have been factors as to why some students scored as they did on the test. Time did not permit the researcher an



opportunity to investigate the aforementioned points. It remains for further research which would include these and other variables to supply answers and even more reasons.

The teacher is an important element in the educational process. As far as the future of the computer in the educational setting--this writer, along with others in this field are of the opinion that this teaching tool is here to stay. A strong point to be emphasized is that the human element presented by the teacher should not be replaced in the classroom by a machine. However, the computer, used as a teaching tool will become a part of our curriculums just as they have become a part of our society.

#### RECOMMENDATIONS

It must be reiterated here that this study served only as exploratory research. In order to confirm or provide more conclusive data, a confirmatory research study must be completed in order for the results to be more generalizable. Based upon the findings, observations, and subsequent conclusions of this study, the researcher submits the following other recommendations:

1. This study should be repeated using representative

samples from another school in order to determine if the experimental method is more or less effective at another locale.

2. Based upon observations by the researcher, the experimental group seemed to exhibit greater interest than the control group. Therefore, the study should be modified to see if significant changes in motivation, attitude, and interest occur during the experimental period.

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# APPENDIX A

## A SIMPLE REPORT

OBJECTIVES:

1. Describe the format for a report.
2. Explain how to calculate margin settings.
3. Explain how to set up APPLE WRITER for printing a report.
4. Explain how to enter, save, and print a report.

REPORT FORM

By setting up a report as suggested in this assignment, you will have a document that looks professional and easy to read. Reports that look professional improve your image in the eyes of the reader, whether the reader is a teacher or your employer. A report represents the person who prepares it.

MARGINS

The space between the edge of the paper and the printed words is known as a margin. Therefore, a report has a left margin, a right margin, a top margin, and a bottom margin. The left margin setting should be the number of characters in one inch (10 or 12). For the right margin setting, subtract the number of characters in an inch from the number of columns available across the page. At 10 CPI, subtract 10 from 85, which gives a margin setting of 75. At 12 CPI, subtract 12 from 102, which gives a margin setting of 90.

The top margin of the first page of a report is usually 1.5 inches at 10 CPI. Multiply 1.5 times 6 (the number of lines in an inch) to get a margin of 9 lines, with printing beginning on Line 10. At 12 CPI, the top margin of the first page is usually 2 inches. Multiply 2 times 6 to get a margin of 12 lines, with printing beginning on Line 13. For convenience when adding additional pages to a report, it is recommended that the top margin be set to one inch. Then press RETURN either three times or six times to get the desired first page margin.

The bottom margin should be 1 inch, which is 6 blank lines. When text requires less than a full page, however, the bottom margin will be larger.

SPACING

The number of blank lines between lines of print is known as the line interval. After the heading of a report, there are two blank lines (a line interval of two). Other lines have a line interval of one; that is, there is one blank line between each pair of printed lines.

PRINTER LINES

Most printers print six lines per inch. Therefore, if you are printing on standard 11 inch paper, you would suspect that the maximum number of printed lines on a page is 66 (6 lines times 11 inches). With AppleWriter, this may or may not be true. If you want to, you can specify a maximum number of printed lines less than the physical

length of the paper. For this lesson, however, you should specify 66 printed lines per page.

### HEADING

The heading of a report is its title. It tells what the report is about. The heading, in uppercase letters, is centered on the first line below the top margin.

### JUSTIFICATION

Justification refers to how lines of text are positioned on the page. APPLE WRITER gives you the choice of four kinds of justification. Center justification places each line of text in the horizontal center of the page, resulting in both left and right ragged (uneven) edges. Left justification starts all lines evenly at the left margin and leaves the right margin ragged. Right justification ends all lines evenly at the right margin, resulting in a ragged left margin. Full justification inserts extra spaces between words so that all lines start evenly at the left margin and end evenly at the right margin. In this assignment, the heading is center justified; all other lines of text are left justified.

### CONTROLLING APPLE WRITER'S PRINT FORMAT

There are two methods of controlling APPLE WRITER's print format. As you learned in the introduction of the unit, one of these is the use of the Print/Program Commands Menu. The other is the use of text-embedded print commands.

### USING THE PRINT/PROGRAM COMMANDS MENU

In this assignment, you will use the Print/Program Commands Menu to set the margins and the line spacing. Remember that this menu is selected by entering Control-P. When the print/program: prompt appears at the bottom of the screen, enter a question mark to display the format options. Then enter the new values. Here are the values to enter for a report, for both 10 CPI and 12 CPI:

Command	10 CPI	12 CPI
LM (Left Margin)	10	12
RM (Right Margin)	75	90
TM (Top Margin)	6	6
BM (Bottom Margin)	6	6
PL (Printed Lines)	66	66
LI (Line Interval)	0	0

Remember that once the settings have been made, they may be saved on the diskette for future use. To do this, enter Control-Q to display the Additional Functions Menu. Then select Option 4 (Save Print/Program Value File) and enter a file name under which the values will be stored.

### USING TEXT-EMBEDDED PRINT COMMANDS



Any print commands that may be entered with the Print/Program Commands Menu may also be placed in your text. Print commands that are placed in your text are called embedded print commands. APPLE WRITER always begins printing by using the values from the Print/Program Value File. Then whenever it finds a value embedded in the text, it changes to the embedded value. This feature makes it easy to have a two-inch top margin on the first page and a one-inch top margin on other pages.

Each print command to be embedded in the text is entered on a separate line, with a RETURN both before and after the line. Enter a period, then the two-letter command abbreviation and the setting. Here are two examples: .CJ tells the computer to center justify the following text; and .FJ tells the computer to align the following text at left and right margins.

When you enter the text for this assignment, you will use some text-embedded print commands. The heading will be center justified, while the other lines will be left justified. Here is how the first several lines you enter should look. (RETURN) is used to show you where to press RETURN.

(RETURN)	Since top margin is set to six,
(RETURN)	these RETURNS will make 1.5-inch
(RETURN)	top margin on first page
.CJ (RETURN)	Center justify heading
ELECTRONIC TYPESETTING (RETURN)	Heading in uppercase letters
.LJ (RETURN)	Left justify rest of text
(RETURN)	First and second blank lines
(RETURN)	after heading
	Set line interval to 1 for remainder
	of report

## UNDERLINING

Another text-embedded command that can be used causes text to be underlined when it is printed. Text to be underlined is marked by a reverse slash (\) at the beginning and end. Put the slashes where the spaces between words normally go. For example, the line THE\FIRST WORDS\I HAVE UNDERLINED will be printed as THE FIRST WORDS I HAVE UNDERLINED.

Remember: Once underlining starts, it will continue until the second reverse slash is found to end it. Therefore, if you forget to insert the second reverse slash, underlining will continue until the end of your document.

## STUDENT EXERCISE

In this computer exercise, you will enter a one-page report, save it, and print it in the correct format.

1. Enter the report following these directions. Use text-embedded print commands for centering the heading, setting up left justification, and setting the line interval. Don't forget to

use the reverse slashes for underlining. When you have entered the report, save your text on your diskette.

2. Select the Print/Program Commands Menu and enter the values given in this assignment to set up the format for printing a report. Then select Option 4 from the Additional Functions Menu, and save the Print/Program values in a file named REPORT FORMAT.

3. Print the report. Submit your disk with your report.

#### ELECTRONIC TYPESETTING

By (YOUR NAME)

Probably no development since the invention of moveable type has had as much impact on the printing industry as has electronic typesetting. It is a technology that has made itself felt from the smallest neighborhood printshop to the largest corporate giant.

The earlier electronic typesetters (or composers, as they are called) required that all text be entered on their keyboards. In other words, it mattered not whether an author had composed a document using pencil and paper, typewriter, or word processor. To typeset the material, the text had to be rekeyed on the typesetter's own keyboard.

Persistent developments, however, led first to a unit capable of receiving text over a phone line from a computer or word processor. The units were developed to read the floppy disks produced by a multitude of computers and word processors directly. Since direct reading is much faster than communicating over a phone line, the text is made available to the composer much more quickly.

Once the reading of text is complete, the codes used by the originating word processor for underlining, bold printing, and so on, are automatically translated to the codes required internally by the composer.

# APPENDIX B

## WORD PROCESSING INFORMATION SHEETS

WORD PROCESSING\*\*\*\*\*BUSINESS COMPUTER APPLICATIONS  
INSTRUCTOR: J. V. SMITH

Objectives for the Unit: (The student shall learn to . . .)

1. create, load, and save a file
2. correct mistakes
3. delete and retrieve characters or entire paragraphs
4. search the disk's catalog for file names
5. insert text
6. move text around
7. print what has been written
8. exit Apple Writer and turn off the computer

---

Note: A Word about the Apple Writer Master Disk

One of the most important rules about Apple Writer is never save documents to your MASTER disk. Use that disk only for loading Apple Writer programs.

If you have two disk drives, you can keep the MASTER disk in one disk drive and the initialized disk in the other.

---

How to Start Up Apple Writer

1. With your thumb on the disk label and with the label facing up, put the Apple Writer II master disk into drive 1 and close the drive door.
2. Turn on your display device.
3. Turn on your Apple IIe computer. (You may use `IO-open apple-reset1`, if the computer is already on.)
4. After about 15 seconds Apple Writer's name and copyright date will appear at the top of the display--the Copyright Screen. When the Copyright Screen appears, it means that the Apple Writer program has been placed into the computer's memory.
5. Press the return key.
6. If you have one disk drive, you should now remove the master disk. Put it in a safe place. Put an initialized disk into the disk drive.
7. If you have two disk drives, you should put your initialized disk in drive 2.

---

Typing Text:

The display should be blank, except for the blinking cursor and a row of letters and numbers across the top called the data\_line.

## TYPE

I'M FINALLY USING A WORD PROCESSOR!

Use the computer's keyboard just as you would a typewriter's. However, there are a lot of differences between your Apple IIe and a typewriter. One difference is line endings.

### \*\*\*\* Line Endings and Word Wraparound

When you come to the end of a line on an electric typewriter, you always press a return key, causing the carriage to slide back to the beginning of the next line. When you think about it, that's a pretty time-consuming motion. You don't have to use that motion on your computer--it will automatically return your cursor to the beginning of the next line.

Press the Apple IIe's return key a couple of times; the cursor will move down the display. Type your name enough times without pressing return to take up several lines of the display. Keep your eye on the display when you notice the cursor getting to the end of a line. And don't worry about mistakes.

Did you notice the display when the cursor moved to the end of the line? When there wasn't enough room for a word at end of the line, the cursor took the word and automatically moved it down to the beginning of the next line. It's an automatic carriage return, commonly referred to as word\_wraparound.

NOTE: There will be times when you will want to use the return key, of course. For instance, if you wanted to type an indented paragraph, you would press return and then indent the desired number of spaces with either the space bar or the tab key. You will also want to use the return key to end a paragraph, to end a line before it is filled up with text (as in an address list), or to create a space between one paragraph and another.

---

## CLEARING MEMORY

To clear the memory, simply press.....[N] (When brackets enclose a letter, (as in [N]), they indicate that the letter is a command, and you should hold down the control key while pressing the letter inside the brackets. It is not important to Apple Writer whether you type upper- or lowercase letters.) The computer will then ask you if you really want to erase memory.

---

## LOADING FILES

Each time you start up Apple Writer and want to work on a particular document, you have to take that file from its storage space on the disk

and put it into memory. This is called loading a file.

Type [L]. The display will reply with [Lload]. You then type the name of the file you wish to load. (If you make a mistake, use the delete key to delete a letter at a time.)

Apple Writer always loads files so that the last few lines are visible. To get to the beginning of the file, you must move the cursor.

---

#### MOVING THE CURSOR WITH [E] AND [B]

Press [B]                      Cursor moves to the beginning of the document.

Press [E]                      Cursor moves to the end of the document.

---

#### MOVING THE CURSOR WITH THE ARROW KEYS

If you want to move the cursor up or down or left or right, use the arrow keys located in the lower-right corner of your keyboard.

If you want to move the cursor even faster, hold down the closed apple key while pressing an arrow key. The closed apple key when used with the left and right arrow keys will move the cursor left or right one word.

The closed apple key, when used with the upper and lower arrow keys will move the cursor up or down 12 lines.

---

#### DELETING AND RETRIEVING TEXT

When you use the delete key, you can never get your characters back. Use the arrow keys to move the cursor just to the right of the word you wish deleted.

Press the DELETE KEY              One character is deleted from the word.  
Hold it down; more letters are deleted.

Hold down open                      Character are deleted as the cursor  
apple and press                      moves back over them, from right to  
arrow key                              left.

The letters or words deleted can be retrieved from memory by using the opposite arrow key.

Notice the Data Line at the top of the display. The first character in the line (in the upper-left corner) is an arrow, called the direction arrow. The direction arrow is very important when deleting words and paragraphs.

Press [D]                      The arrow on the Data lines changes direction.

## Print

To print a document in memory, press [P].

The screen will display the message [P]rint/Program: (If you want to obtain the Print/Program Command Menu, type ? .

To change any one of the options, type the two letter code, then type the value you want.

If you don't have a printer attached to your computer, you can print the document on the screen by changing the print destination (PD) to 0.

If your printer controller card is in slot 1, you're ready to print. With the [P]rint/Program: prompt still displayed, type NP for "new print."

---

## DELETING A FILE

Press [D].

Type F.

Type the name of the file. \_\_\_\_\_

## GETTING HELP

You have now learned most of the basic steps involved in using Apple Writer. But there may be times when you forget how to execute a command or find you need assistance. For such times, use the Help Screen Menu.

You obtain the Help Screen Menu by holding the open apple key and then typing a question mark. Remember, the Apple Writer MASTER DISK must be in drive 1 when you call up the help screens.

---

## MAKING A BACKUP COPY AT SESSION'S END

At the end of a sessions, you should always back up your work in case the original disk is damaged. A disk can become unusable after exposure to direct sunlight, moisture, magnets, and extremes of heat and cold. A disk also can be damaged by writing on its label with a pencil or ball-point pen.

---

## EXITING THE SYSTEM

Press [Q].

Press K.

---

## TABS

PRESS [T]. (Setting tabs.)

Press P for "purge."

Press the space bar the number of spaces you wish the tabs to be set.

PRESS [T] and then S for "set."

(Clearing tabs.) To clear one tab from your document, simply put the cursor on the unwanted tab position using the tab key and give the clear tab command.

---

## FIND AND REPLACE

Load the file MOTTO into the computer from the MASTER DISK.

Press [B]. The cursor moves to the beginning of the document, and the direction arrow is set to >.

Press [F]. Type the word you wish to find. In this example, it is "/Satety/".

The [F] command looks for all occurrences of the word or phrase you specify. The command is stopped by pressing the space bar.

To replace one word by another, type /the word to find/the word to replace/ return. If there is more than one occurrence, the cursor will move to the next occurrence.

The use of A after the final slash, stands for "all," and replaces all occurrences of the correction or change.

---

## SPLITTING THE SCREEN

Be sure the MASTER DISK is in drive one. Load the file named LEASE.

Press [N] and then Y and return.

Load LEASE.

Press [B].

Press [Y]. Type Y for "yes" and press return to split the display.

Press the downward arrow key to scroll the document in the bottom half of the display.

You may also load another document into the memory:

Press [E].

Press [L] and type the name of the file.

Press [Y] and then return to switch control of the cursor from one display to the other.

To get back to a single display, press [Y] and type N for "no" and press the return key.



\*\*The computer treats everything in memory as one document--even if you are using a split display. Any changes you make to either display are incorporated into a single document. If you load a file into the bottom display for reference, it becomes part of the top display and must be deleted before saving the edited document.\*\*

---

## THE GLOSSARY

Press [G].

Type ? for "define."

(Clearing memory with [N] does not erase the glossary. To get rid of the glossary in memory you must purge it, by pressing [G] and then an asterisk (\*), or turn the computer off.

---

## TERMS TO REMEMBER

Press [D]                   The direction changes again.

Press [D]                   The arrow points to the left (←).

Press [W]                   A word is deleted.

Press [D]                   The last word deleted is retrieved.

Press [X]                   A paragraph is deleted.

---

### INSERTING TEXT

To insert text, simply move the cursor to the place where you want text inserted and begin typing. If you make a mistake, press the delete key to erase it, then type the correction.

---

### SAVING A FILE

Press [S]. You will see [S]ave!; give the file a name and return. If you are using a second drive, add sd2 to the file name.

Don't wait until you've completed a document to save it to a disk. Save what you've been working on every 20 minutes or so--or even more often.

---

### FINDING FILE NAMES IN THE DISK CATALOG

Press [O]                   To get the DOS Command Menu

---

DEFAULT: That which the computer will opt to choose. The default drive is the disk drive you used last.

DESIGNATOR: Used with the [G] command. A designator is a single character that can represent an entire word or phrase.

FILE: A unified body of text as saved on a disk with its own name.

LOADING A FILE: To copy a file from its place of storage on the disk and put it temporarily into memory.

MEMORY: A temporary storage area for a document; while it is in memory, the document can be edited or printed.

PROMPT: A message given by the computer to remind you that some action is expected.

SAVING A FILE: To permanently store a document on a disk. Once stored on a disk, a document is called a file.

# APPENDIX C

## BLOCK STYLE LETTER

Assignment: PRODUCING A BLOCK STYLE LETTER

Instructor:

Your Name:

Objectives: 1. Identify the parts of a business letter.  
2. Describe open punctuation.  
3. Describe the procedure for producing a block style business letter with open punctuation.

### Letter\_Style

There are a number of different styles of business letters, but the block style letter is perhaps the most frequently used. It can be entered quickly because all parts of the letter begin on the left margin. There is no need to set different tabs or indentions.

The following paragraphs describe the procedure for entering a block style letter with APPLE WRITER. After you enter the date, press RETURN once for each line space to be left between the dateline and the letter address. Press RETURN once after each line of the letter address. Press RETURN again to enter a blank line both before and after the salutation. In the example letter, open punctuation is used. This means that no punctuation is entered after the salutation or the complimentary close.

Enter the body of a letter in the same way that you enter a report; that is press RETURN only at the end of each paragraph.

Press RETURN after each of the lines in the complimentary close, typed name, typed title, and reference initials. Also, leave a blank line before and after the reference initials.

### Setting\_the\_Print\_Format\_Values

As is the case with other documents, the format of a letter is determined by using the Print/Program Commands menu. The top margin can be controlled in one of two ways. One way is to vertically position the letterhead paper at the point where the date is to be printed. In this case, TM (top margin) on the Print/Program Commands menu is set to 0 (zero). Note: If TM is set to 0, the first line of your letter may be indented one space. This cannot be avoided. Another way of controlling the top margin is to align the top edge of the letterhead paper with the top edge of the print head. In this case, TM must be set to equal the number of blank lines required to print the date on the desired line.

The left and right margins are set as desired. Most businesses use a standard 6-inch-wide line. To use a 6-inch line, set LM (left margin) to 12 and RM (right margin) to 72. The position of the firm's name on their letterhead paper sometimes determines what the left and right margins should be. The line interval (LI) should be set to 0 (zero) since business letters are usually single-spaced. The blank lines required in a letter are entered by pressing RETURN, as explained above. Print Mode (PM) is

usually set to left justify (LJ) for letters, although some businesses use left and right justified margins (FJ). Set SP (single page) to 1 (one) if single-sheet paper is used. When you set SP to 1 and enter Control-P and then NP, you will be prompted with INSERT SHEET, PRESS RETURN. Insert and align the letterhead page before pressing RETURN.

### Exercise

1. Enter the following letter in block style with open punctuation. Each (P) in the copy indicates that a new paragraph should be started at that point.

March 30, 1984    Mr. Charles E. Cobbins, Manager    Advertising  
MicroChips Manufacturing, Inc.    49825 El Camino Real    San Jose,  
CA 95129-9778    Dear Mr. Cobbins    Thank you for your inquiry  
about our advertising services. In addition to being known for  
exciting television commercials, we also have a print advertising  
department which specializes in four-color process,  
computer-generated graphics, multiple type fonts, and writers who  
produce some of the most creative copy in the business. (P) I am  
inviting you to meet with members of our staff on April 27 at 9:00  
a.m. In this meeting you will have the opportunity to discuss  
your next fall's advertising campaign. (P) I look forward to  
hearing from you soon to confirm this appointment. Please call if  
I can answer any questions.    Sincerely    Lisa Y. Cruz    Vice  
President, Marketing

2. Use the following information for setting the print format values: Set the top margin for 2 inches, and set the side margins using a 70-space line.
3. Save the letter to your disk.
4. Print the letter.
5. On the back of your letter, write the print format values that you used on the bottom of the letter.

March 8, 1984 ← DATELINE

Mrs. Mona W. Powell  
Director of Educational Media } ← LETTER ADDRESS  
City Middle Schools  
Fayetteville, NC 28303-3882 }

Dear Mrs. Powell ← SALUTATION

Thank you for your letter inquiring about our software products. Our current line of software products includes software designed for all grade levels and subject areas. The software packages should be used to help students become proficient as they learn from their textbooks.

I am enclosing a catalog that lists the software products, their prices, and ordering information. Also enclosed is a sample diskette for you to review some of our most popular software products. You should feel free to keep this diskette so that teachers in your school system can review the programs also.

Our sales representative, Miss Gail Flowers, will call you soon. She will be able to answer any questions you may have.

Sincerely, ← COMPLIMENTARY CLOSE

Mark J. Weinland, Manager ← TYPED NAME  
Southern Regional Sales ← TYPED TITLE

Enclosures ← ENCLOSURE NOTATION

# APPENDIX D

## WORD PROCESSING UNIT TEST & ANSWER SHEET



[M]	FILE
[L]	DESIGNATOR
[P]	DISK OPERATING SYSTEM
[T]	MASTER DISK
[G]	PROMPT
[S]	DATALINE
[D]	OPEN APPLE
[N]	DELETE KEY
[W]	-----
[O]	ARROW
[B]	WORD WRAPAROUND
[E]	DELIMITER
[X]	s
[Q]	p
[Y]	f
?	k

Fill in the blanks:

1. One of the most important rules about Apple Writer is never save documents to your \_\_\_\_\_.
2. The row of letters and numbers across the top of the editing screen is called the \_\_\_\_\_.
3. The automatic carriage return is commonly referred to as \_\_\_\_\_.
4. To clear the main memory of the computer, type \_\_\_\_\_.
5. To load a file, type \_\_\_\_\_.
6. The \_\_\_\_\_ deletes text that cannot be retrieved.
7. The \_\_\_\_\_ and \_\_\_\_\_ delete or retrieve characters as the cursor moves from the left to the right.
8. To delete or retrieve words, type \_\_\_\_\_ and \_\_\_\_\_.
9. To delete or retrieve paragraphs, type \_\_\_\_\_ and \_\_\_\_\_.
10. The first character in the dataline is a/an \_\_\_\_\_.
11. To save a file, type \_\_\_\_\_.
12. To get to the DOS Command Menu, type \_\_\_\_\_.
13. DOS means \_\_\_\_\_.
14. To obtain the Print/Program Command Menu, type \_\_\_\_\_ and \_\_\_\_\_.
15. To exit the system, type \_\_\_\_\_.

16. \_\_\_\_\_ and \_\_\_\_\_ are pressed to set tabs.
17. \_\_\_\_\_ and \_\_\_\_\_ will take the user to the beginning or the end of a document.
18. \_\_\_\_\_ will split the screen.
19. \_\_\_\_\_ obtains the glossary memory.
20. \_\_\_\_\_ is a message given by the computer to remind you that some action is expected.

Short Answer:

21. Define Word Processing as defined in the text:
22. The printers in our classroom have 10 CPI. What does CPI mean?
23. What are the margins for a 60-space line, if the paper has 85 horizontal spaces?
24. When the line interval (LI) is set at 0, what kind of spacing does the printer use?
25. When the TM is set at 12, how many inches will be in the top margin?
26. When using the text-embedded command .CJ, what will the printer do with all lines of type?  
With .FJ?  
With .LJ?
27. Describe the procedure for producing a block style business letter with open punctuation. (This should include how to set the margins, what the LI should be, how to save the letter, how to print the letter, whether you use .LJ, .FJ, what is open punctuation, etc. You may draw an example with your description. Please write each fact on a separate line.)

ANSWER SHEET FOR  
WORD PROCESSING UNIT TEST

1. MASTER DISK
2. DATA LINE
3. WORD WRAPAROUND
4. CONTROL N
5. CONTROL L (NAME OF THE FILE)
6. DELETE KEY
7. OPEN APPLE AND ARROW KEY
8. CONTROL W
9. CONTROL X
10. ARROW
11. CONTROL S: FILE NAME
12. CONTROL O
13. DISK OPERATING SYSTEM
14. CONTROL P AND QUESTION MARK
15. CONTROL Q: K
16. CONTROL T AND S
17. CONTROL AND B
18. CONTROL Y
19. CONTROL G
20. PROMPT
21. USE OF A COMPUTER TO CREATE, VIEW, EDIT, STORE, RETRIEVE AND PRINT TEXT MATEIAL.
22. CHARACTERS PER INCH

23. LM = 10 AND RM = 75

24. ZERO SPACING OR SINGLE SPACING

25. TWO INCH TOP MARGIN (2)

26. .CJ WILL CENTER ALL LINES

.FJ WILL ADD EXTRA SPACES BETWEEN WORDS SO THAT LINES BEGINNING AT THE LEFT WILL BE EVEN AND LINES ENDING AT THE RIGHT WILL BE EVEN.

.LJ WILL TYPE ALL LINES EVEN AT THE LEFT MARGIN.

27. DESCRIBE THE PROCEDURE FOR PRODUCING A BLOCK STYLE BUSINESS LETTER