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A STUDY OF THE EFFECT OF A COMPUTER
WRITING PROGRAM ON THE WRITING
ABILITY OF ELEMENTARY
STUDENTS

by
Barbara A. Autuore

A THESIS

Submitted in partial fulfillment of the requirements of the Master
of Arts Degree in Elementary School Teaching in the Graduate
Division of Rowan College
1995

Approved by _____

Date Approved *March* 1995

ABSTRACT

Barbara A. Autuore

A Study of the Effect of a Computer

Writing Program on the Writing

Ability of Elementary

Students

1995

Dr. Louis Molinari, Advisor

Elementary Education

The purpose of this study was to determine if significant differences in the creative writing of students would arise between a group of second grade students using a computer writing program and a group of second grade students using the traditional pencil and paper method of writing. The students were also given an attitude survey to determine whether or not the computer had an effect on their attitudes toward writing.

Students in both the control and experimental groups were holistically rated on a pre-test writing sample. Both groups were also given an attitude pre-test. One group of students wrote stories using the

computer writing program, Storybook Weaver: World of Adventure, while the other group used traditional pencil and paper methods of writing. The students were given a writing post-test and an attitude post-test at the end of the study. The pre-test and post-test scores were then statistically analyzed to determine if a significant difference existed. Since no significant differences were found in the writing abilities or the attitudes of the two groups, both null hypotheses were accepted.

MINI-ABSTRACT

Barbara A. Autuore

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Ability of Elementary
Students

1995

Dr. Louis Molinari, Advisor

Elementary Education

The purpose of this study was to determine if there were any significant differences in the writing ability and attitudes toward writing between students who used a computer writing program and those who used traditional pencil and paper methods of writing. No significant differences were found in the students' writing abilities or attitudes toward writing.

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CHAPTER ONE

The Problem

Significance of the Problem

The computer is becoming an increasingly common fixture in America's classrooms. This is a step in the right direction toward building a technologically literate society. However, in many cases, the computer is not being used to its full potential. This is particularly evident in the elementary schools. All too often the computer software found in elementary classrooms focuses on drill and practice and rote memorization rather than on higher order thinking skills such as those outlined in Benjamin Bloom's well-known taxonomy.

The computer has become a tool which can be used in many areas of the curriculum. It is particularly effective in the area of word processing. When children have the abilities to use the word processor effectively, they may find ways to do some creative writing. This activity

depends, on a large part, on the understandings the classroom teacher brings to the process. Creative writing is an area that is not encouraged by drill and practice type programs.

Workman reports that, "the computer is a tool not fully understood by most teachers of writing....most English teachers still work with books, paper, pencils, pens, and chalk" (Workman, 1982, p.204) There seems to be a need for teachers of the language arts to become more familiar with all of the opportunities related to the writing process provided by the computer in the classroom.

"The recent passage of Goals 2000: Educate America Act has given a major boost to the national effort to develop educational standards for all Americans" (Donovan and Sneider, 1994, p.40). This is evident through the development of the National Council of Teachers of Mathematics' Standards, and the American Association for the Advancement of Science's Project 2061. Standards involving the use of technology in English and language arts are currently being developed. A group from the University of Illinois, the National Council of Teachers of English, and the International Reading Association plan to have the Standards Project for English and Language Arts completed by late summer 1995. The Standards will include knowledge of media and technology in their definition of literacy. (Donovan and Sneider, 1994).

Many studies have shown that the word processor can be a useful tool in helping students to become proficient at writing. Research by Robinson-Stavely and Cooper (1990) indicates that community college and introductory English composition students using the word processor scored significantly better in writing than their peers who were not using a word processor. (Polin, 1991)

Studies on the effects of a word processor on the writing abilities of younger students have yielded results similar to that of Robinson-Stavely and Cooper (1990). One such study was done by Gredja and Hannafin (1992). The study examined revision patterns and writing quality of sixth graders using a word processor. The study concluded that "significant differences were found for both mechanical and organizational revisions in favor of the word processing group" (Gredja and Hannafin, 1992, p.144).

Owston, Murphy, and Wideman (1991) conducted a study that found eighth grade students produced better quality writing assignments when using the computer as opposed to traditional pencil and paper work. Their study also found very favorable attitudes toward any work that was assigned on the computer, including writing. (Owston, Murphy, and Wideman, 1991) "Hawisher and Selfe (1989), in a review of a large number of studies of computer writing, also found that students typically exhibit positive attitudes toward writing on computers" (Owston, Murphy,

and Wideman, 1991, p.84).

Although an abundance of research exists that suggests the effectiveness of word processors on student writing, little research can be found on story writing programs. These are computer programs which combine word processing abilities with creative writing elements such as graphics for illustrating purposes, on-screen writing prompts to guide the students' writing, and a choice of page layouts for the story.

There are still a large number of people who are very skeptical about the use of the computer in the writing process. Lynne Anderson-Inman (1987) states the following:

Use of CAI software assumes that the instruction or practice involved on the computer will promote improved performance on similar tasks *off* the computer. The wide-spread use of CAI in the language arts curriculum assumes that this transfer of skills from the computer to noncomputer-based classroom tasks occurs automatically.(p.24)

Another concern about the computer is that "...we are in the midst of one of those many educational bandwagons that governments, industry, and others so like to ride. This wagon is pulled in the direction of a technological workplace, and carries a heavy load of computers as its cargo" (Apple, 1991, p.59). Apple (1992) also states that:

Computers involve ways of thinking that under current educational conditions are primarily *technical*. The more the new technology transforms the classroom into its own image, the more a technical logic will replace critical political and ethical understanding. The discourse of the classroom will center on technique, and less on substance. (p.75)

Rose and Meyer (1994) also express a concern about the computer, "With this print-oriented culture, new technologies are emerging. Everywhere there are signs that these new technologies will erode the language arts that have been central to our culture, our civilization, and our schooling." (p.290) Additionally, they state another concern that in this world of television, computers, and video games, no one will learn to read or write. (Rose and Meyer, 1994)

Since there are some opposing views about the use of the computer in the language arts curriculum, and little research on the effects of story writing software on children's ability to write creatively, this study will focus on the use of a story writing computer program and its effects on student writing abilities.

Statement of the Problem

Could it be that the writing abilities of second grade students improve by using a specific computer writing program? Could it be that there will be a difference in the attitudes toward writing between students using the computer writing program and those not using the program?

Purpose of the Study

It is the purpose of this study to determine if second grade students using a computer writing program will improve in their ability to produce quality writing more than students who use only the traditional approach. It is also the purpose of this study to determine if the use of the computer influences the students' attitudes toward writing.

Hypotheses

1. There will be no significant differences between the writing ability of second grade students using a computer writing program and those second grade students using traditional pencil and paper techniques as

measured by pre and post test holistic scoring of writing samples completed by students in both the control and experimental groups.

2. There will be no significant differences in the attitudes towards writing between the second grade students using the computer writing program and those second grade students using traditional pencil and paper techniques.

Methods and Procedures

This study included a class of twenty-four second grade students at the George L. Hess Educational Complex. The class was divided into two groups of students with equivalent writing abilities. Each group consisted of twelve students. One group of students was randomly selected to be the experimental group in the study. The remaining students made up the control group.

A pretest was given to each student in the class to assess their writing skills at the beginning of the study. Each student was given the same story starter and was asked to write a story about it. The students' writing was then holistically scored. The students were also given an attitude pretest to assess their attitudes toward writing. During the course of the study, Group II, the control group was instructed in creative writing through traditional pencil and paper methods. The experimental group,

Group I, used the computer to do their creative writing.

At the end of the six week study, the students were given the same story starter and were again asked to write a story about it. The stories were holistically scored, and a comparison was made between the scores of the two writing samples done by both the control and the experimental groups. The students were also given an attitude post-test to determine whether the use of the computer had any impact on their attitude toward writing.

Limitations of the Study

The following are limitations to the study:

1. The research was limited to twenty-four students, twelve in the experimental group, and twelve in the control group.

2. There is a larger representation of males than females. (However, this closely represents the boy to girl ratio in second grade at the Hess School this year.)

Definition of Terms

CAC- Computer Assisted Composing

CAI- Computer Assisted Instruction

Holistic Scoring- A method of rating student writing which involves the use of a checklist of criteria that are assigned numeric values.

Story Starter- A sentence or two intended to provide students with a topic for a writing assignment.

Story Writing Program- A computer program that includes a word processor as well as some additional features such as graphics, and guided instructions.

Word Processor- A computer program designed primarily for the use of writing and formatting text. It can be used to write letters, stories, reports, memos, journals, etc. Typed information can be stored on a disk for retrieval later, or printed immediately.

Organization of the Study

Chapter I includes an overview of the entire study. It presents the significance of the study, the statement of the problem, the purpose of the study, the hypotheses, methods and procedures, limitations, definition of terms, and the organization of the thesis.

Chapter II presents a review of the literature which pertains to the study. The review includes an introduction to the study and a presentation of research related to the issue of using the computer to improve writing ability.

Chapter III describes the study in detail, including the definition of the population from which the sample was drawn, the description of the instruments used, and the procedures followed.

Chapter IV presents the data and analyzes the statistics which pertain to the rejection or acceptance of specific hypotheses of the study.

Chapter V summarizes the findings of the preceding chapters, draws certain conclusions, notes important trends, and makes recommendations for further study.

CHAPTER TWO

Literature Review

Both research and classroom practice are showing that computers can be an exciting new tool for the teaching of writing. (Schwartz, 1986) They have also been described as "...highly motivating learning tools that actively engage students in the writing process" (Montague, 1993, p.46). Cochran-Smith states that, "Teachers and researchers also speculate that students like word processing because they feel powerful when they control the technology, are less intimidated as writers because a machine rather than a person is the first audience for their efforts, and are impressed by the professional-looking results of their products." (Cochran-Smith, p.144, 1991) Since the writing process is often a painstakingly long and difficult undertaking, anything that can be done to make it more appealing to students would be considered a blessing by many educators.

Schwartz (1986) describes many advantages to using the computer in favor of pencil and paper methods of writing. The first of these

advantages is that students do not have to recopy when they need to rewrite something. Students can make deletions and insertions with little effort. A second benefit of the computer is that student drafts are easier to reread because they are free of messy proofreading marks. Still another advantage cited by Schwartz is that students who do not like their handwriting, require more revision space, or are afraid of making errors in their writing will feel more comfortable with the product they produce on the computer. (Schwartz, 1986)

Montague and Fonseca (1993), in their research, have reported findings similar to those found by Schwartz (1986). They describe computer assisted composing (CAC) as a very beneficial way of teaching writing, especially to students with learning disabilities. Some of the benefits Montague and Fonseca (1993) encountered include the following:

1. Students tend to spend more time on the draft process when they use CAC rather than pencil and paper.

2. CAC encourages interaction between students and their teachers.

Writing conferences...can be scheduled or occur spontaneously as the teacher circulates among students who are composing on the computer.

3. In addition to improving the development of writing skills, CAC appears to have a positive effect on the development of reading

skills.

4. Students' attitudes toward writing generally seem to improve with CAG. (p.46)

Donald Graves, a researcher, author, and professor of education at the University of New Hampshire, suggests that students make judgements about their writing skills at an early age which are often based on the appearance of their writing. He goes on to say that, "Many writers, particularly males, have heard for years that their writing is messy. Sadly, they equate messiness with lack of knowledge. If the writing is not pleasing to the eye, they decide it must not be pleasing to the mind." (Green, p.145, 1984) Graves sees the neatness of the computer copy as a possible way to help students get past some of the stumbling blocks of writing. (Green, 1984)

Some promising results were found by Robinson-Stavely and Cooper (1990) in their study of the effect of word-processing on students' writing in community college remedial and introductory English composition courses. The study included a computer using group and a non-computer using group. Pencil and paper written stories were transferred onto a word processor for scoring purposes. Papers written by both groups were randomly selected to be scored by both a holistic rater and a computer software program which analyzes text. Some of the items measured

included spelling errors, readability, grammar errors, average sentence length, and complexity of the sentences. The results showed that the writing of students using the word-processor was rated higher than the writing of those not using the computer. The text analyzing program also found the work of the word-processing group to have higher scores in four categories. The researchers suggest that the two analyses show the writing of the computer using group to be more sophisticated. (Polin, 1991)

According to research by Owston, Murphy, and Wideman, (1991) the computer can be a powerful writing tool for junior high students. They studied the effects of word processing on the writing abilities of eighth grade students. The study found that eighth grade students produced better quality work on the computer when given two similar writing tasks - one on the computer, and the other with pencil and paper. Owston et al. (1991) suggest four possible explanations for their findings:

1. The observed differences may be an artifact of the superior spelling of the computer written work.
2. The observed differences may be due to lengthier papers written on computer as opposed to off computer.
3. The students' very positive attitudes toward writing on the computer may have led to higher levels of effort being made during computer-based writing.

4. Experience and familiarity with the word processor may have allowed the students to more easily edit and revise their writing and so encouraged them to make more significant revisions at all stages of their work, thus improving its overall quality. (Owston et al., p.81, 1991)

Owston, Murphy, and Wideman's (1991) findings seem to concur with many researchers' findings that the impact of word processing on revision strategies could have educational significance, since revision has been found to be one of the most important parts of the writing process. (Owston et al., 1991) Whatever the reasons may be for the superior writing of the students using the computer, the fact that cannot be ignored is that its use *did* result in better writing samples.

Gredja and Hannafin (1992) conducted a study to examine the effects of word processing on the holistic writing quality and revision patterns of sixth graders. Their research shows the computer to be a potential benefit to younger students, particularly in the area of writing. The study involved sixty-six students divided into three groups, each assigned to a specific revision technique: pencil and paper, word processing, or a combination of both techniques. The students were given the tasks of revising a standard composition, and writing and revising an original composition. The results showed that, "Significant differences were found

for both mechanical and organizational revisions in favor of the word-processing group. In addition, word processing students tended to correct more first-draft errors and to make fewer errors than their counterparts did." (Gredja and Hannafin, p.144, 1992) Since the ability to revise well seems to be a factor that separates great writers from good writers, these results are very promising. Educators need to be aware of the potential benefits of the computer when developing their language arts curriculum.

First grade students have also been found to produce better writing through the use of a word-processor. Kuechle found that, "Use of the computer helps sustain the interest and enthusiasm of youthful authors while supporting a diversity of writing experiences." (Kuechle, p.39, 1990) In her research, Kuechle (1990) used computers for language arts instruction in a learning center approach. The first graders in the experimental group used several phonics programs, including Snoopy's Reading Machine (Random House), a story writing program called Kidwriter (Spinnaker), and a word-processing program called Magic Slate (Sunburst). The students were also using a listening center and a traditional pencil and paper writing center. Writing samples of the students using these centers were compared to writing samples of first grade students in another class not using the computer centers. An analysis of the writing showed the computer using group wrote much more fluently than those students not

using the computer centers. In addition, the stories of students who used the computer were longer, slightly more mature, and had closer spelling approximations. (Kuechle, 1990)

While there are a considerable number of studies that seem to suggest the computer is an invaluable tool in the language arts classroom, there are some researchers who have doubts about its usage in the writing process. One of the concerns was that the use of the computer may hamper the quality of the writing. Another concern was that the computer may negatively effect one's ability to write using traditional pencil and paper methods if it is used as a primary means of writing. Some educators expressed concern that the five steps of the writing process: prewriting, drafting, revising, proofreading, and publishing, would not be followed through on the computer. Keyboarding skills was the most common area of concern among researchers. Many of them felt that writing on the computer necessitates intense training on the keyboard, and therefore makes the computer an inefficient tool for writing, particularly for younger children who generally have minimal proficiency with the keyboard.

Learning keyboarding skills is a time factor that educators may need to take into consideration before beginning writing instruction on the computer. Cochran-Smith, Kahn, and Paris (1988) found that all writers

seemed to need a period of time for learning word processing before they could also use it for writing. They also found that, "for young children who have neither well-developed writing strategies nor efficient typing skills, the learning period may indeed be much lengthier than it is for older more experienced writers." (Cochran-Smith, p.145, 1991) "Daiute (1983) suggested that sustained word processing training, for as much as one year, may be needed before sufficient technical proficiency is acquired to improve writing." (Gredja and Hannafin, p.148, 1992) Others have made similar findings about the teaching of keyboarding.

Researchers Kahn and Freyd (1990) note the following about the teaching of keyboarding skills:

"If you only have a few computers to serve a lot of students, it's obvious that more people will get to use the machines if everyone can type reasonably quickly and accurately. However, few schools have anywhere near enough equipment to even consider teaching keyboarding to everyone." (Kahn and Freyd, p.84, 1990)

As Kahn and Freyd point out, whether or not keyboarding skills are necessary for efficient writing on the computer may be secondary to the fact that the time and resources are generally not available for doing it.

Some researchers have found that the use of the word processor in the writing process may have an undesirable effect on the quality of

writing. "Flower and Hayes (1981) reported that word processing may, in the absence of concerted efforts to offset the tendency, inadvertently direct proportionately more attention to structural than holistic aspects of writing." (Gredja and Hannafin, p.148, 1992) Flower and Hayes (1981) suggest that while structural aspects of writing are important visible features of writing, they do not guarantee improvement in the holistic quality of the writing. (Gredja and Hannafin, 1992) Research by Collier (1983) and Hawisher (1987) also suggests that students using the word processor tend to revise more than students using pencil and paper, however, the revisions are often only surface level, and do not greatly improve the overall quality of the writing. (Gredja and Hannafin, 1992)

Many educators feel that the key to good writing lies in the writing process itself. Some feel that the use of a computer does not always facilitate quality writing. Keifer and Smith (1983) suggest that writing solely through the use of a word processor may interfere with traditional pencil and paper methods of writing. They feel that the students may be limited by their technological capabilities when they write via the word processor. (Gredja and Hannafin, 1992)

Anderson-Inman (1987) expresses concern over the transfer of writing skills from writing *on* the computer to writing *off* the computer.

She states that,

"When instructional materials on and off the computer look different to students, call for different responses, or teach a skill using different techniques and terms, students may fail to see that the two contexts focus on the same skill. When this occurs, students may fail to apply what was learned or practiced in the first context (i.e., the computer) to the second (i.e., off the computer)." (Anderson-Inman, p.26, 1987)

Wetzel (1985) reported that students involved in a computers-in-composition program rarely got to the revision stage. "Part of the problem was that each student had only 30 minutes per week at the computer, an unrealistic amount of time to achieve the program goals." (Wetzel, p.131, 1985) He also found, like Cochran-Smith et al. (1988), and Daiute (1983), that the lack of keyboarding skills among the students severely hampered their ability to write fluently.

While there are a significant number of people who are skeptical about the use of the computer in the writing process, most of the current research seems to show that it has great potential, particularly in junior high through college level students. However, there appears to be a lack of research on the use of the computer for writing in the primary grades. So, the following questions are still left unanswered:

1. Can the use of the computer for the teaching of creative writing be just as beneficial to students in the primary grades as it is to older students?

2. Will the use of a story writing program rather than a typical word processing program have any impact on the creative writing of primary students?

It is the goal of this thesis to find the answers to these important questions.

CHAPTER THREE

Design of the Study

The study was designed to determine if there would be a difference between the writing ability of second grade students using a story writing computer program and second grade students using traditional pencil and paper methods of writing. The study was also done to determine whether there would be differences in attitudes toward writing between the students using the story writing program and students using traditional pencil and paper methods.

Setting

The George L. Hess Educational Complex of the Hamilton Township School District, in Mays Landing, N.J., was the setting of the study. The Hess School was built two and a half years ago to accommodate the rapidly

expanding community of Hamilton Township. Hamilton Township's population has grown over 40% in the last twenty years from 6,445 in 1970 to 16,012 in 1990, with an estimated population for 1992 at 16,907.

Hamilton Township's per capita income in 1989 was \$15,948. The majority of the township's residents are employed in sales, administrative support, or as technicians. The second most common occupations are managers and professionals, followed by service occupations.

The Hamilton Township School District consists of two elementary schools and one middle school. The Hess School contains the grade levels, K, 2, 3, 4, 5, and 6, with roughly ten sections of each. Nearly 1,500 children attend the school. According to the 1992-1993 New Jersey School Report Card, the ethnic make-up of the Hess School was 68.8% White, 23.4% Black, 4.8% Hispanic, .1% Native American, and 2.9% Asian/Pacific Islander.

Currently, 42.5% of the students at the Hess School receive free or reduced cost lunches, 18.3% receive Basic Skills Instruction, 1.6% receive E.S.L. instruction, 11.1% receive Special Education, and 7.1% receive Gifted and Talented instruction. The New Jersey Department of Education has rated this district as one of low socioeconomic status. There is also a 40% transiency rate due, in part, to the nearby casino industry.

Description of Population

The population for this study was comprised of a class of twenty four second grade students from the George L. Hess Educational Complex in Mays Landing, New Jersey. The class was divided into two groups so that each group had equivalent writing abilities represented.

Description of Instrument

The students were given a picture writing prompt from the Macmillan/McGraw-Hill Performance Assessment Handbook. The picture was made up of two frames. The first frame showed two children, a boy and a girl, wearing bicycle helmets and standing next to an open garage door holding up their bicycles. The second frame pictured the boy and girl riding their bicycles down a street with a single tree in the background. The directions called for the students to look at the picture and write a story about what they thought was happening. They also stated that the story needed to be at least three sentences long. According to the Macmillan /McGraw-Hill Performance Handbook, the writing sample should focus on telling a story, present a story line with a clear beginning and

end, and present events in sequential order.

The students' writing abilities were rated using the Macmillan/McGraw-Hill Reading/Language Arts Modified Holistic Scoring Criteria. These criteria were used to assign a number value from zero to four to each student's writing sample. A score of 4 indicates an excellent writing sample. A good writing sample would be given a score of 3. Scores of 2, 1, and 0 represent fair, unsatisfactory, and unscorable writing samples respectively. (See Appendix for further clarification on excellent, good, fair, unsatisfactory, and unscorable writing samples.) The same writing prompt and assessment scale was used for both the pretest and the posttest. The posttest for the computer using group was completed on the computer rather than with pencil and paper.

The students were also given an attitude survey adapted from the Macmillan/McGraw-Hill Student Self-Assessment Survey. The survey had two multiple choice questions and two open ended questions. The questions focused on students' attitudes toward writing, and their perceptions of themselves as writers. The survey was administered both at the beginning and the end of the study to determine students' attitudes toward writing, and whether or not the use of the computer altered their attitudes.

Relationship of the Instrument to the Null Hypothesis

The purpose of this study is to determine if second grade students using a computer writing program will improve in their ability to produce quality writing more than students using the traditional pencil and paper approach. It is also the purpose of this study to determine if the use of the computer influences the students' attitudes toward writing.

The differences in writing abilities between Group I- (those students using the computer writing program) and Group II - (those students using the traditional approach) were measured using the Macmillan/McGraw Hill Reading/Language Arts Modified Holistic Scoring Criteria. Student attitudes were measured with the Macmillan/McGraw Hill Student Self-Assessment Survey.

Procedure

Two groups of students were formed so that each group contained students of equivalent writing abilities. One group of twelve students was randomly chosen to be the experimental group, Group I, while the remaining group of twelve was the control group, Group II.

All of the students were given an attitude survey adapted from Macmillan/McGraw-Hill's Student Self-Assessment Survey at the beginning of the study. They were also given a picture writing prompt from the Macmillan/McGraw-Hill Performance Assessment Handbook and were asked to write a story about it. The writing samples were then holistically scored on a scale from zero to four, with four being the highest.

Group I was given instruction in writing for ten minutes a day, five days a week, using an Apple IGS computer, and the story writing program, Storybook Weaver: World of Adventure. The program offers a word processor with additional features for creative writing such as graphics, borders, backgrounds, and on-screen prompts for the title page and author. It also allows the student to select a page layout for each page of their story that may or may not include graphics, depending on the child's preference. A "spell" button allows students to click the mouse on any of the graphics they have put in their illustrations, and get the spelling for those objects. Students also have the option of saving their stories to a disk so that they can retrieve them at a later date for revising and printing.

The Group I students were monitored as often as possible to ensure that they were on-task. They were limited to four graphics per page so that they had time to write.

Group II was given instruction in writing via traditional pencil and paper methods. They were not permitted to use the computer for writing purposes. They wrote stories in their writing journals and on paper. All of their first drafts, revisions, and final drafts were also made on paper.

All of the students from Group I and Group II were again tested at the end of the study using the same writing prompt from Macmillan/McGraw-Hill. The students' writing was holistically scored using the zero through four scale. They were also given the Macmillan/McGraw-Hill Student Self-Assessment Survey again to determine if their attitude toward writing would be a factor of the group they were in.

Summary

This chapter describes the setting, population, testing instruments used, and the procedures involved. Twenty-four students were involved in the study, divided into two groups of equivalent writing abilities. One group received writing instruction on the computer through the use of the program, Storybook Weaver: World of Adventure, while the other group received writing instruction through traditional pencil and paper methods. Both groups were given an attitude survey at the beginning and the end

of the study. Both groups were also holistically rated on their ability to write a story from a given picture prompt. Scores from the first and second set of tests were compared to determine if any significant difference in attitudes or writing abilities occurred as a result of the instructional methods used.

CHAPTER FOUR

Analysis of the Data

Introduction

The major purpose of this study was to determine if significant differences in the creative writing of students would arise between a group of students using a computer writing program, and a group of students using the traditional pencil and paper method of writing. The students using the computer wrote stories using the program Storybook Weaver: World of Adventure. These students wrote for ten minutes a day, five days a week, and were periodically monitored to assure that they were on-task. The students who were not using the computer wrote in their writing journals and on paper.

The creative writing ability of the students was measured by having both groups complete a writing sample at the beginning and at the end of the study. The students were also given an attitude survey to determine

whether or not the computer had an effect on their attitudes toward writing.

The hypotheses tested were:

1. There will be no significant differences between the writing ability of second grade students using a computer writing program and those students using traditional pencil and paper techniques as measured by pre and post-test holistic scoring of writing samples completed by students in both the control and experimental groups.

2. There will be no significant differences in the attitudes toward writing between the second grades students using the computer writing program and those students using traditional pencil and paper techniques.

Analysis of Data Related to the Null Hypotheses

The first null hypothesis stated that there would be no significant differences between the writing ability of students using a computer writing program and students using a traditional pencil and paper approach to writing.

The results of the pre-tests and post-tests for the computer-using

group, Group I, are shown in Table 1. The holistic scores for both the pre-test and the post-test writing samples, as determined through the use of the Macmillan/McGraw-Hill Reading/Language Arts Modified Holistic Scoring Criteria, ranged from a low of 1 to a high of 4. The mean score for the pre-test writing samples of Group I (experimental) was 2.67. The mean

<u>TABLE 1</u>			
Results of the Pre-tests and Post-tests of Group I			
Holistic rating of 1 (lowest) to 4 (highest)			
<u>GROUP I - COMPUTER - USING STUDENTS</u>			
<u>STUDENT</u>	<u>PRE-TEST</u>	<u>POST-TEST</u>	<u>DIFFERENCE</u>
A	4	4	0
B	1	1	0
C	3	2	-1
D	3	1	-2
E	2	1	-1
F	4	1	-3
G	3	3	0
H	2	3	1
I	2	2	0
J	1	3	2
K	4	3	-1
L	3	3	0
MEAN	2.67	2.25	

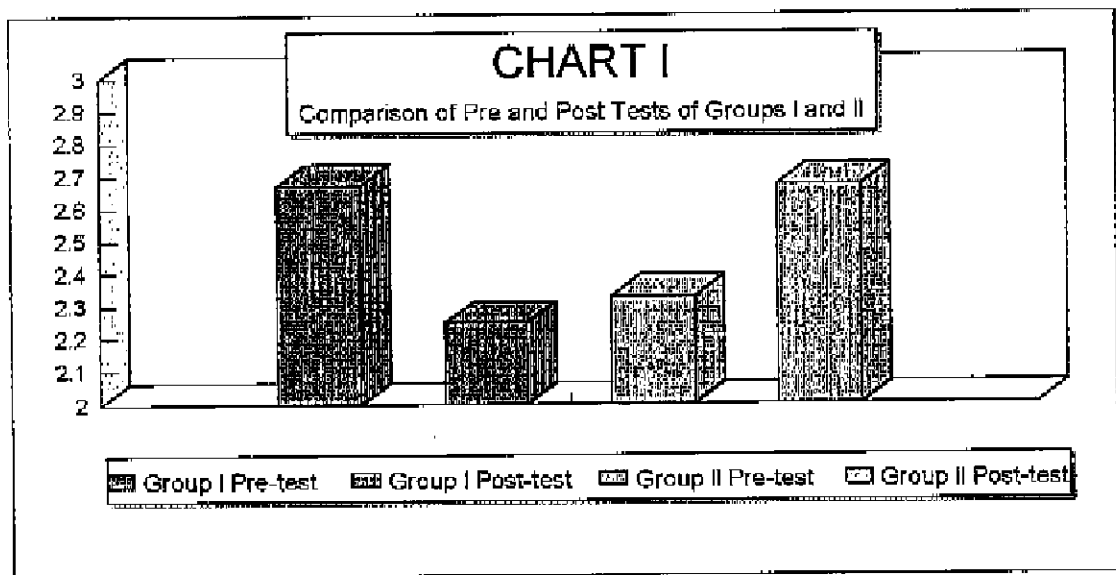
score for the post-test writing samples was 2.25. The difference between the means was 0.42, indicating an overall decline in Group I's scores from the pre-test to the post-test.

Table 2 shows the results of the pre-test and post-test scores of the writing samples done by Group II (control), the students using a traditional pencil and paper approach to writing. The scores ranged from 1 to 4, and

TABLE 2			
Results of the Pre-tests and Post-tests of Group II			
Holistic rating of 1 (lowest) to 4 (highest)			
GROUP II - TRADITIONAL - PENCIL & PAPER			
<u>STUDENT</u>	<u>PRE-TEST</u>	<u>POST-TEST</u>	<u>DIFFERENCE</u>
A	3	4	1
B	1	2	1
C	2	2	0
D	4	4	0
E	2	3	1
F	2	3	1
G	3	2	-1
H	3	4	1
I	4	3	-1
J	2	2	0
K	1	2	1
L	1	1	0
MEAN	2.33	2.67	

were also determined through the use of the Macmillan/McGraw-Hill Reading/Language Arts Modified Holistic Scoring Criteria. The mean score for the pre-test writing sample of Group II (control) was 2.33. The post-test mean for this group was 2.67. The difference of the means was 0.34, indicating an overall increase in Group II's scores from the pre-test to the post-test.

Chart 1 presents a summary of the pre-test and post-test means for both Group I and Group II. These results show that Group I (experimental) experienced a *decrease* of 0.42, while Group II (control) experienced an *increase* of 0.34.



A *t*-Test was used to determine the statistical significance of the difference between the means for Groups I and II. Table 3 shows the results of the *t*-Test done on the computer program PC STAT. The mean

TABLE 3				
Results of the <i>t</i> -Test for the Difference Between the Means of Group I and Group II				
<u>OBS NUM</u>		<u>SAMPLE 1</u>	<u>SAMPLE 2</u>	<u>DIFFERENCE</u>
1		0.0000	-1.0000	1.0000
2		0.0000	-1.0000	1.0000
3		1.0000	0.0000	1.0000
4		2.0000	0.0000	2.0000
5		1.0000	-1.0000	2.0000
6		3.0000	-1.0000	4.0000
7		0.0000	1.0000	-1.0000
8		-1.0000	-1.0000	0.0000
9		0.0000	1.0000	-1.0000
10		-2.0000	0.0000	-2.0000
11		1.0000	-1.0000	2.0000
12		0.0000	0.0000	0.0000
SAMPLE MEAN	=	0.146667	SAMPLE MEAN 2=	-0.333333
STAN DEV1	=	1.311372	STAN. DEV. 2=	0.778499
MEAN OF DIFF	=	0.750000		
STAN DEV OF DIFF	=	1.658312		
HYPOTHESIZED DIFF	=	0.050000		
† STATISTICS	=	1.462252		
DEGREES OF FREEDOM	=	11		

difference for Group I (experimental) was 0.42 with a standard deviation of 1.311372. The mean difference for Group II (control) was 0.33 with a standard deviation of 0.778499. The *t* value of 1.462252 falls between the critical values of -2.201 and +2.201, thus indicating that there was not a significant difference in the means between Group I and Group II.

The students were given the Macmillan/McGraw-Hill Self-Assessment Survey to determine whether or not the computer had any effect on their attitudes toward writing. Table 4 shows two of the survey questions and student responses. The students were asked to fill in one or two types of things they like to write. The choices provided included letters, reports, newspaper stories, make-believe, songs, stories, poems, and directions. Group I's post-test scores indicate that 6 of the 12 students prefer to write songs. This was a change from their pre-test results which indicated letters, stories, and poems were the preferred types of writing assignments. Group II's pre-test and post-test results both indicated that stories are the preferred type of writing for that group. When asked, "Are you a good writer?," 50% of the students in Group I (experimental) responded *Yes* on the pre-test. The remaining 50% responded *No*. Group I's responses to the same question on the post-test resulted in a *Yes* response of 75%, and a *No* response of 25%. Group II (control) students were also asked whether they thought they were good writers or not. Pre-test results for

Group II (control) showed a *Yes* response of 75%, and a *No* response of 25%. Group II's post-test responses matched their pre-test results. Group I (experimental), the computer-using group, showed a 25% increase in *Yes* responses from the pre-test to the post-test. Group II (control), those students using the traditional method of writing, showed neither a gain nor a loss in *Yes* responses from the pre-test to the post-test. The students

TABLE 4

Results of the Macmillan/McGraw-Hill
Student Self-Assessment Attitude Survey

<u>QUESTION</u>	<u>GROUP I</u>	<u>GROUP I</u>	<u>GROUP II</u>	<u>GROUP II</u>
	Pre-test	Post-test	Pre-test	Post-test
1. When you write, you like to write -				
--Students chose 1 to 2 answers--				
letters	4	4	1	1
reports	1	1	5	2
newspaper stories	2	1	2	1
make-believe	2	2	4	2
songs	2	6	3	3
stories	4	3	6	7
poems	4	1	0	2
directions	2	1	1	1
2. Are you a good				
writer?				
Yes	6	9	9	9
No	6	3	3	3

were also asked to rate how much they like to write. The answer choices were, I like to write, I love to write, and, I write only when I have to. Chart 2 shows Group I's pre and post-test responses. There was no change in student responses from the pre-test to the post-test for Group I.

CHART 2

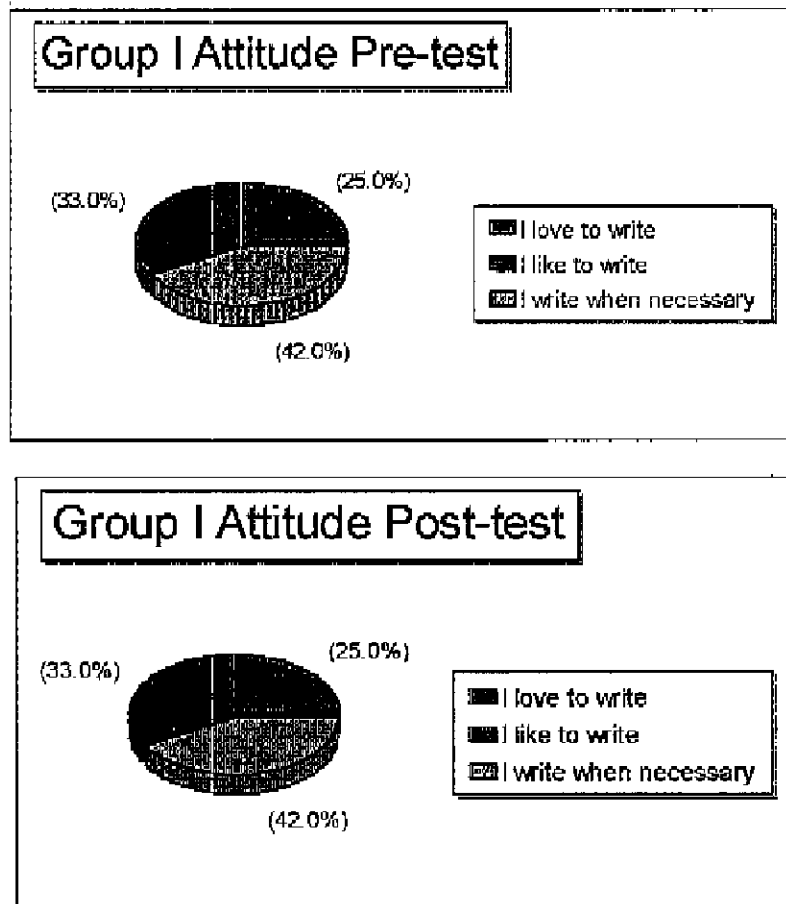
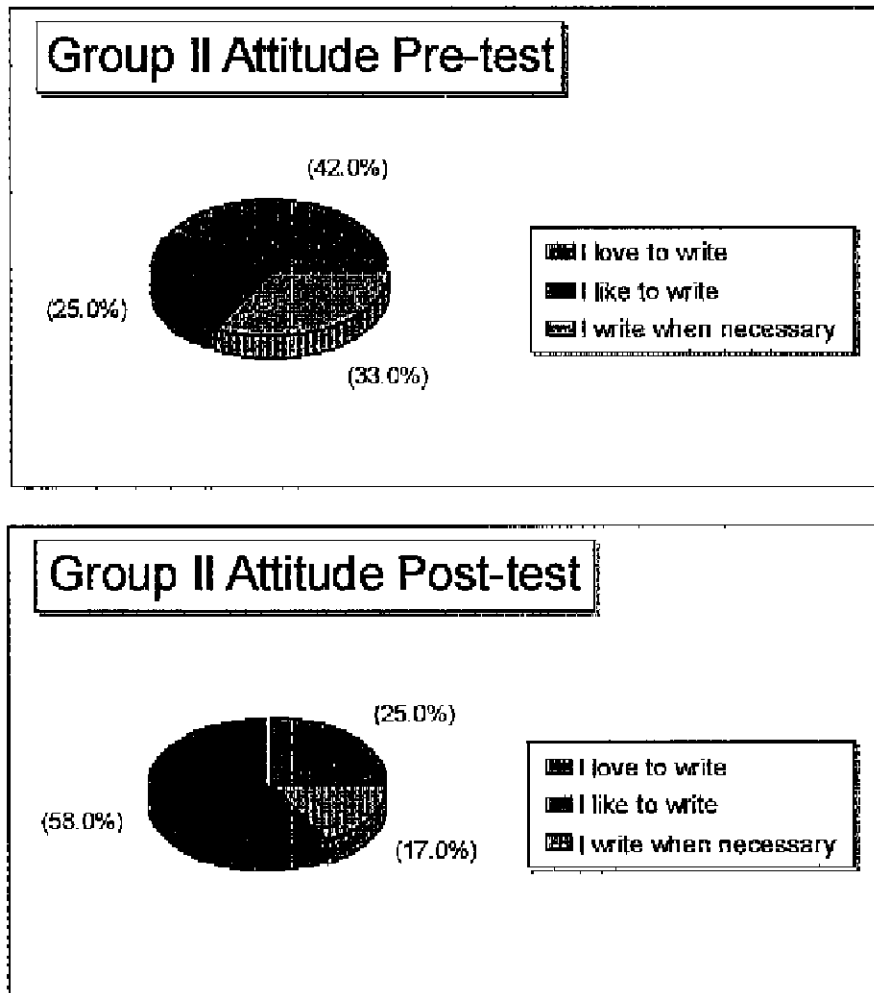


Chart 3 shows Group II's responses to the same questions. The number of students who responded that they loved to write decreased by 17% from the pre-test to the post-test. However, the number of students who responded that they liked writing increased by 33%. The number of

CHART 3



students who responded that they write only when they have to decreased by 16%.

Summary

Although Group I's (experimental) holistic writing scores went down slightly while Group II's (control) scores went up, the results of the data analysis show that there is no significant difference between the writing ability of students using a computer writing program and students using a traditional pencil and paper approach to writing. Therefore, the null hypothesis must be accepted.

Group I's attitudes toward writing did not show much of a change from the pre-test to the post-test. The number of Group I (experimental) students who responded that they were good writers went up by 25%; however, their responses to whether they like to write, love to write, or write only when necessary, remained the same from the pre-test to the post-test. The number of students in Group II (control) who responded that they were good writers remained the same from the pre-test to the post-test. Unlike Group I, Group II experienced a decline in the number of students who responded that they write only when they have to.

CHAPTER FIVE

Conclusions and Recommendations

Summary of the Problem

The purpose of this study was to determine if second grade students using a computer writing program would improve in their ability to produce quality writing more than students who use only the traditional pencil and paper approach to writing. It was also the purpose of this study to determine if the use of the computer influenced the students' attitudes toward writing. The study involved twenty-four children from one second grade class at the George L. Hess Educational Complex in Mays Landing, New Jersey.

Two null hypotheses were formulated for this study. The first hypothesis stated:

1. There will be no significant differences between the writing ability of second grade students using a computer writing program and those

students using traditional pencil and paper techniques as measured by pre and post test holistic scoring of writing samples completed by students in both the control and experimental groups.

The second hypothesis stated:

2. There will be no significant differences in the attitudes towards writing between the second grade students using the computer writing program and those second grade students using traditional pencil and paper techniques.

Summary of the Method of Investigation

A class of twenty-four students from the Hess Educational Complex were selected for this study. The students were divided into two groups with equivalent writing abilities. The experimental group, Group I, received writing instruction on the computer through the use of the program, Storybook Weaver: World of Adventure, while the control group, Group II, received writing instruction through traditional pencil and paper methods. The students in each group were given a pre-test and a post-test to determine whether a difference in writing ability existed between the students using the computer writing program, Storybook Weaver: World of Adventure, and those students using the traditional pencil and paper

method of writing. An attitude pre and post-test was also given to determine whether the computer had any impact on the students' attitudes toward writing.

The holistic writing scores of Group I and Group II were statistically analyzed using the *t*-test for the difference between two means. Results of the pre and post-test attitude surveys for Group I and Group II were also compared.

Summary of the Findings and Conclusions

The writing ability of the students in Group I, the experimental group, experienced a slight decrease from the pre-test to the post-test. Group II, the control group, showed a slight increase in their writing ability from the pre-test to the post-test. The differences in the scores of each group were not statistically significant.

Attitudes toward writing varied slightly between Group I (experimental) and Group II (control); however, the variations were not large enough to produce any significant differences.

Since no significant differences were discovered between Group I and Group II, both null hypotheses were accepted.

Implications

The results of this study showed that there were no significant differences in the writing abilities or the attitudes toward writing between students using a computer writing program and students using a traditional pencil and paper approach to writing. However, there were some important trends noted in this study. The holistic writing scores of the computer using group went down slightly while the scores of the students using traditional pencil and paper methods went up. These results may be due, in part, to the fact that second grade is very often the year in which students emerge into true writers. The muscles in their hands and wrists are developing, and the physical task of writing something on paper is becoming easier. Many of the students do not have sufficient knowledge of the computer keyboard at this age in order to compose with ease. Therefore, students writing with pencil and paper may seem to have an easier time. Perhaps several lessons in keyboard familiarization prior to the use of a computer writing program would result in an increase in the holistic writing scores of the computer using group.

Recommendations for Further Study

Numerous studies have been conducted that illustrate the effectiveness of the computer in developing good writers at the junior high and high school levels. This study was unusual in that it focused on primary school children. Further studies could be done for a longer period of time with a larger sample of primary school students. This will provide more accurate results which could then be generalized to a larger population of students.

Additional studies could be done in which the experimental group receives lessons in keyboard familiarization *before* they begin to use a computer writing program. The keyboarding instruction may prove to be a crucial element in the success of the computer writing program.

Appendix

Macmillan/McGraw-Hill Reading/Language Arts Modified Holistic Scoring Criteria

- 4 An excellent writing sample:
- * establishes and focuses on the purpose of the writing task
 - * shows a clear awareness of the intended audience
 - * organizes content and ideas in a logical way, and is fluent and cohesive
 - * includes appropriate details to clarify ideas
- Mistakes in grammar, mechanics, and usage do not detract from clarity and meaning.*
- 3 A good writing sample:
- * focuses on the purpose of the writing task
 - * shows some awareness of the intended audience
 - * organizes content and ideas in a logical way, although transitions may not be fluent
 - * includes some details to clarify ideas
- Mistakes in grammar, mechanics, and usage do not detract from clarity and meaning.*
- 2 A fair writing sample:
- * has some awareness of the purpose and intended audience

Macmillan/McGraw-Hill Reading/Language Arts
Modified Holistic Scoring Criteria

- * attempts to organize content and idea, but is not particularly fluent or omits transitions

- * includes some details

Mistakes in grammar, mechanics, and usage may detract from clarity and meaning.

1 An unsatisfactory writing sample:

- * is confused in purpose or does not respond to the task

- * does not present content in an organized or logical way

- * includes few or no details

Mistakes in grammar, mechanics, and usage may detract from clarity and meaning.

0 An unscorable writing sample is blank, unreadable, incomplete, or "defiant" (e.g. "I don't want to write about this.")

Macmillan/McGraw-Hill

PERFORMANCE ASSESSMENT HANDBOOK

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