2005

Comparison of effectiveness between Merit Software and traditional grammar instruction for ninth grade students

Cynthia JoAnn Furr

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COMPARISON OF EFFECTIVENESS BETWEEN MERIT SOFTWARE AND
TRADITIONAL GRAMMAR INSTRUCTION FOR NINTH GRADE STUDENTS

A Project
Presented to the
Faculty of
California State University,
San Bernardino

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts
in
Education:
Instructional Technology

by
Cynthia JoAnn Furr
September 2005
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Aug 4, 2005
Date
ABSTRACT

Research was done to determine whether the Merit Software helped to improve the grammar skills of ninth grade students at Palm Desert High School. Pre and Post tests were administered and students were given daily whole class instruction using the software for three months. Lesson plans and a software description are included.

The purpose of the study was to compare the use of Merit Software on a single computer to the traditional textbook approach used to teaching grammar to ninth grade high school students.

Research showed that neither method of instruction was effective. The use of the computer based software for whole-class instruction showed an 11% mean decrease in student scores from pre-test to post-test. The class using the traditional text-book method demonstrated a mean decrease of 4%. Overall, student’s ability to correctly identify parts of speech decreased using either method, but the decrease was less using the traditional, text-book method.
ACKNOWLEDGMENTS

SPECIAL THANKS TO THE STUDENTS OF PALM DESERT HIGH SCHOOL FOR THEIR PARTICIPATION IN THIS STUDY.

THANKS ALSO GO TO DR. EUN-OBK BAEK AND DR. BRIAN NEWBERRY FOR THEIR ASSISTANCE AND GUIDANCE THROUGHOUT THE WRITING OF THIS PAPER.

SPECIAL THANKS TO MR. RICHARD RUOCO FOR HIS HELP, SUPPORT, AND UNDERSTANDING OF STATISTICAL ANALYSIS THAT MADE THE COMPLETION OF THE PAPER POSSIBLE.

FINAL THANKS GO TO MY CLASSMATES AND PROFESSORS, WITHOUT WHOM NONE OF THIS WOULD EVER HAVE BEEN COMPLETED
DEDICATION

This paper is dedicated to my students.
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CHAPTER ONE

BACKGROUND

Introduction

A focused integration of technology is the goal for California school districts as noted locally in the Strategic Plan of Desert Sands Unified School District, which follows state mandates. However, the funding for hardware and software is not increasing as much as the educational dependence on them. Although most software programs are designed and tested for computer lab situations, many classroom teachers are faced with the task of integrating technology while being provided with only one classroom computer. This study aims to determine whether a popular grammar assistance program can be successful with whole class instruction rather than individual student workstations.

Computers first entered the realm of education in 1963 when the Vocational Education Act passed and money was used to support the use of technology in schools. In 1965 the Elementary and Secondary Education Act passed and brought still more money into technology for schools, but most of the technology was for administration and counseling purposes to keep track of student records.
Through the late 60’s and early 70’s computer use continued to make a slow progression into the schools - but not yet into the classrooms. In 1971, Intel’s first microprocessors and the first microcomputers were developed - yet, they were mostly used in the business world. In 1975 Apple I’s were donated to schools, and by 1979 there were 15 million personal computers in use worldwide. By 1981, we started to see education drill and practice programs for personal computers; and by 1986, 25% of high schools used personal computers for college and career guidance, while K-8 schools were mainly using Apple II and Macintosh computers, high schools were using DOS-based clones (Murdock, 1998).

Statement of the Problem
Many teachers across California are being encouraged to integrate technology more effectively into their curriculum, as noted in the Desert Sands Strategic Plan and the California State Standards. However, they are faced with strict budgets that often allow for only a single computer cart to be shared by multiple teachers in the same subject area or grade level team. With most research and software being constructed around the assumption of a computer lab being used, it is often
difficult for a well meaning teacher to include these programs in the educational setting.

Purpose of the Project

The purpose of the project was to determine whether the Merit Software program, "Write it Right" could be effective in a whole class setting (using one computer) rather than in a computer lab. The further purpose was to identify if this strategy was more effective than the use of the traditional textbook method of grammar study in the ninth grade.

As we strive to prepare students for the 21st century workplace, technology has made its way into the classroom. Globally, schools are putting an emphasis on bringing technology into the classroom. This usually means the installation of a computer lab or two to be used by specific computer-related classes all day, and are unavailable to students in core subject classes (English, math, social studies, science). At many school sites, the "integration" of computers has meant making the Internet "available" in every classroom and giving each teacher a computer through which to access the Internet and e-mail. However, security concerns have labeled these computers "teacher only" since they contain grade, test, and private
e-mail information. Therefore, while the schools may have a significant number of computers on campus, few of them are being used by students.

Research Questions

Will students learn more from the computer based technology than from traditional grammar instruction? Is it possible to use software designed for lab use for whole class instruction using only a single computer connected to an LCD projector?

The researcher’s hypothesis is that use of the computer program even on a single workstation will demonstrate greater growth in student scores. Stated in the null: There will be no difference in performance between students receiving traditional text-based language instruction and students who receive instruction via the Write it Right software.

Significance of the Project

Teachers are being asked to integrate technology with limited resources. This study investigated a single computer program to see if it could be used within the common limitations of a standard classroom at her school.

Examining how a variety of software applications can be used in the classroom is beneficial to those teachers
who don't have the time or computer skills to judge this for their own. In some cases computers are placed in classrooms and then not used because the teacher doesn't have the knowledge or software available to use.

The structure of the classroom can also be considered when introducing technology. Can stations be set up? Is the teacher limited to a single computer? How much time must be allotted? These are all questions that research such as this can help answer for others.

Limitations

During the development of the project, a number of limitations were noted. These limitations are presented in the next section.

The following limitations apply to the project:

1. The reliability of the students to complete the work assigned that is being used as a means of assessment is not guaranteed. In a mixed-ability level class, there are often many students who will simply not do the work, it's not a matter of ability, just effort.

2. The font size of the program was sometimes difficult to view when projected through the LCD projector.
3. Some students prefer working one-on-one with a computer versus the whole class model suggested.

4. With only one computer system it may be difficult to allow smaller groups to work on the computer apart from the whole class.

5. It may also be difficult for the entire class to agree on an answer or a spokesperson.

6. The study began at the beginning of the school term, when students had not been exposed to grammar instruction for three months. This may have an impact on initial test scores as students may have forgotten information they once knew.

7. Students were with the teacher 55 minutes per day to receive guided instruction through the English/Language Arts class. After taking attendance, making announcements, etc., class time is often limited to 30-40 minutes making it difficult to cover all content.

8. Attendance during the time frame of the student was excellent, so there was a minimum of time lost to students. This assures that a maximum of instruction was give to all students in each group.
Definition of Terms

The following terms are defined as they apply to the project.

9th grade classroom - these are 14-15 year old males and females in a public school system. Some students have attended public schools their entire lives, while others came to public school for the first time this year. The school year is from September to mid-June.

Academic Performance will be indicated by an increase in scores on a pre- and post- grammar test.

CAI - Computer Assisted Instruction

Computer Program used will be Merit Software's Writing Mechanics and Grammar Software for High School Students program (specifically "Write it Right," see Appendix A).

ILS - Integrated Learning System

LCD Projection Panel is a special liquid crystal display panel that connects to a computer and sits on an overhead projector to project an image onto a display screen.

Single Workstation will be the teacher's computer hooked to an LCD projector for whole class viewing.
Student learning will include the actual gaining of knowledge as well as the student’s interest level in learning the subject matter.

Writing Ability is the student’s ability to communicate their thoughts in a clear, coherent manner. It also includes proper use of standard mechanics of English and English Grammar.
CHAPTER TWO

REVIEW OF THE LITERATURE

Introduction

Chapter Two consists of a discussion of the relevant literature. Specifically, Computers in Education and Writing Education and Computers.

Computers in Education

Factors for Successful Technology Integration

When discussing computer use in education, it is important to look at the entire school environment as McNabb (1999) points out in her summary for the 1999 Secretary's Conference on Educational Technology. It is essential to realize that not all technology will be successful and that the end result of the evaluation is to create a positive change. During the conference, states had the opportunity to share their state-level technology evaluations. One key factor seemed to permeate through the conference, “the more access to technology students had and the more their teachers believed that technology could help and were trained to use the technology, the higher students scored on the Stanford 9” (p. 2). Even though summate evaluations showed growth, a need has risen to identify and collect technology evaluation that is
relevant to each local level and in turn becomes useful to stakeholders. Seven key evaluating tools arose from the conference (McNabb, 1999, 2-11):

(1) "The effectiveness of technology is embedded in the effectiveness of other school improvement efforts" (McNabb, 1999, p. 2). Within each school’s vision there are several components in which technology is only one. But when using technology, an increase in outcomes is noted, however, the outcomes can and will vary depending upon the level of which technology implementation has been attained.

(2) "Current practices for evaluating the impact of technology in education need broadening" (McNabb, 1999, p. 2). In evaluating technology it is essential that teachers align their use with the curriculum, standards, and with their individual learning goals. When integrating these elements stakeholders are able to understand how using technology changes teaching and learning. Thus the varying effects of technology will allow a clearer understanding for the stakeholders and help to understand that, “isolating technology as the cause of achievement, productivity, or change is impossible” (McNabb, 1999, p. 2).
(3) "Standardized test scores offer limited formative information with which to drive the development of a schools’ technology program. Most schools are looking for additional means for collecting useful data for this purpose" (McNabb, 1999, p. 3). Standardized test scores have become the accepted measure for growth. But do these scores provide sufficient information regarding improving technology effectiveness in schools? To accomplish this goal a formative evaluation is needed. Formative evaluation can tell what technology applications work, the affects of student attitudes toward learning, development of skills to access, explore, and use higher order thinking skills.

(4) "Schools must document and report their evaluation findings in ways that satisfy diverse stakeholders’ need to know" (McNabb, 1999, 3). The best way to provide this information is through three basic areas. One - demonstrate the importance of technology within the educational system; Two - when does technology make a difference and when does it not; Three - when integrating technology into the curriculum teaching styles change thus requiring multiple evaluations to verify its impact.
(5) "In order for evaluation efforts to provide stakeholders with answers to their questions about the effectiveness of technology in education, everyone must agree to a common language and standards of practice for measuring how schools achieve that end" (McNabb, 1999, 4).

Through experience educators have learned that technology can improve students basic skills, but the tools do not measure how technology improves creative thinking as well as critical thinking. The key is to use evaluation tools, which demonstrate what students can do with technology that they could not do before - this will show an impact.

(6) "The role of teachers is crucial in evaluating the effectiveness of technology in schools, but the burden of proof is not solely theirs" (McNabb, 1999, 6). Technology has added the concept of “new breadth and depth to instruction” (p. 6). In using technology teachers can recognize many key factors in student growth: self-esteem, confidence, deeper understanding of content areas, and clearer involvement with world events all due to integrating technology into the curriculum.

(7) "Implementing an innovation in schools can result in practice running before policy. Some existing policies need to be “transformed” to match the new needs of schools
great potential in impacting our classrooms in a positive way.

John Sculley (as cited in Simpson, 2001) provides a great description of multimedia and the classroom. He imagines a room with a window on the world’s knowledge and a teacher with the capability to bring to life any image, and sound, and event. It allows students the power to visit any place on earth or time in history. Multimedia allows access to so much information it seems like magic and yet is within our grasps.

Gayeski (as cited in Simpson, 2001), multimedia can be defined using the following description: “Multimedia is a class of computer-driven interactive communication systems which create, store, transmit, and retrieve textual, graphic, and auditory networks of information.”

However, Wiburg (1995) points out that student success was correlative to the teacher’s knowledge of the software. Teacher training is integral to student skills improving through the use of these technologies. Overall the uses of computer assisted instruction and integrated learning systems have not reached the potential that was originally perceived when they were introduced.

White (2000) begins with my basic premise - that most schools ended integration of technology with the placement
of one or two computers in a classroom. This idea then progressed into having all schools wired for the Internet. However, there is still the challenge of "bridging the digital divide" as there is a lack of unlimited access for every student. The author has participated in a program that bridges this divide and explains the transformation in her paper. The solution is "NetSchools Solution" - where each student and teacher is given a wireless laptop computer. Within the classroom there is the use of infrared technology and specialized software. At home, students can access a dial-up service. The biggest benefit has been the increase in communication between students, parents, teachers, and administrators. There has also been a decrease in absenteeism and 98% of teachers use the Internet as part of their lessons.

According to "Technology and the Coherent Curriculum" by F.M. Betts (1994), the goal is to shift from using technology as a facilitator to integration and transformation of instruction. In preparing the students for the workplace, curriculum must require that students can analyze, access, and communicate through the use of technology. Betts suggests school sites begin by creating a technology plan. Take an inventory of the current use of technology for each content area and reorganize areas
where technology is lacking. This is the perfect opportunity to enhance instruction using technology. One use of integrating technology would be the use of word processing, which in turn facilitates the writing process. By applying the writing process - prewriting, outlining, drafting, editing, rewriting, and publication, students are more willing to produce written work. To produce literate learners, let us use technology to facilitate and integrate learning to improve the curriculum within the school setting.

"Teachers and technology: making the connection" issued by the Office of Technology Assessment & Public Affairs (1995) states that a large portion of the American society uses technology regularly. It is amazing to note that every year within the past decade 300,000 to 400,000 computers have been added to K-12 schools. But the most valuable component has been overlooked: teacher training. Teachers need opportunities to discover what technology can do, learn to operate the technology, and then have time to experiment ways in which they can integrate it into the curriculum.

Technology is not the "panacea" for all education but with teachers using the tool along with training, application opportunities, and support, students will
become more accomplished learners overall. Technology has the potential to adapt to student learning styles, teach concepts, develop complex systems, problem solving, and practice basic skills, thus creating a classroom in which lecture decreases and the classroom becomes student centered. This can happen when districts provide teacher training that allows for integration of technology into the curriculum. Teachers can attend technology courses to experiment with technology, share experience with peers, and plan lessons using technology. Teachers making connections with technology and becoming comfortable in its use can be very important for insuring future investments in education.

David (1991) discusses the idea that schools today look very much the way they did a hundred years ago. But it's time to face the challenges and prepare students to be productive citizens in today's society and technology has that potential. But the use of technology within the existing teaching styles will not lead to major changes in learning. Transforming schools will only happen when there is a presence of restructuring activities.

According to David, restructuring entails two major steps. First set goals that will challenge students learning - not just improve. Second restructuring
requires the support of the entire system, not just classrooms. This implies that the entire district needs to work together to create a change.

When restructuring, students need to go beyond reciting rules and definitions. They must be able to identify and solve problems with the material learned and be able to work collaboratively as well as alone. This requires teachers to teach students how to apply skills, understand concepts, and take responsibility for learning. Not only are there teacher requirements, but principals as well as districts need to motivate and lead the restructuring.

In restructuring all involved need access to knowledge. "It means creating a culture in schools and districts that expects and values on going learning for students and adults" (David 1991). The greatest item needed is time: time to experiment, create, and to establish a commitment.

Technology has the potential to increase what students know and can do, but using technology can be difficult. It requires new ways to teach which in turn requires changing the education system. "It is essential to the future of our economy and of our society. The
absence of change no longer means standing still; it means moving backward" (David, 1991, p. 35).

In the past two decades, teachers have been provided with training using specific software - but this training hasn't always been incorporated into the classroom curriculum. According to "How Teachers Learn Technology Best," Jamie McKenzie (2001) recognizes that it is time to explore different approaches. The challenge, which needs addressing, is the use of these new technology tools to help student's master key concepts and skills stressed in the curriculum standards. Training should be focused on activities that will translate into higher student achievement by making a difference in daily application.

To begin this challenge schools must start with the curriculum and student learning as their clear objective. From this point standards-based activities can be designed using the available technology. Student learning is the ultimate goal, how they are received is a matter of differing delivery systems. In finalizing this challenge the next step would be to inspire classroom teachers to use these developed activities. However, teachers feel inadequately prepared to take on this challenge. According to an MDR [Market Data Retrieval] report in 1999, 60% of surveyed teachers stated that they received
five hours of annual training with technology. Overcoming this next hurdle can be another challenge for any school district.

However, many school districts have accepted this challenge and adopted new policies to make it a reality. Within the Professional Development Plan teachers are asked to focus on 2-3 areas of growth, and activities that will accomplish this growth. One goal would be to integrate technology into the plan. In conjunction with this goal it is also essential to create study groups to support the ideas. Working as a team to build curriculum units that are standards-based are used with students, which in turn cause an amazing amount of technological learning. Whenever new ideas or concepts are introduced it is always beneficial to have coaches or mentors. The role of these is to provide support using technology that eventually drop away once the teacher has become skilled. Allowing for school visits, providing help lines, and using online learning are all key element which help create a successful experience for teachers, which in turn will create success for the students.

**Students Motivation and Computers**

Waxman and Huang (1997) studied the effect of technology on motivation, anxiety, and classroom learning
environment for sixth and eighth graders who were randomly selected from a multiethnic district. Results indicated that students in classes where technology was often used had significantly higher involvement, satisfaction, and achievement motivation. Results also revealed that eighth graders had higher affiliation, parent involvement and achievement motivation when technology was used even moderately than in classes with little technology use. In math classes it was shown that technology use showed lower math anxiety than other classrooms and higher satisfaction.

To further this concept, Michael Stoll (1998) discusses the distribution of laptops to students in both public and private middle schools (grades 6-8). One aim is to bridge the gap between those with computers at home and those without. On the plus side is that teachers and students think writing is easier, faster, and more productive, making students more motivated to complete assignments. Additionally, with the lack of lockers in many schools this means that heavy textbooks can be replaced with CD ROMS carried in backpacks.

There are teachers that see the negative side of laptops in the classrooms; teachers do not feel they are getting enough training in the computer or guidance in the
use of technology and the curriculum. Additionally, some teachers argue that students are struggling to learn basic concepts without moving on to more advanced technological skills. There are also arguments that computers do not help students learn and they distract students as well.

There is the cost factor but many districts are using grant money and allowing parents to lease computers. Boards feel that by bringing laptops home, students make a positive change for the whole family. Self-esteem is increased, which is a good thing, and leads to greater self-motivation in educational settings.

 Teachers face challenges in education everyday, many realize they will have to deal with computers and technology in the classroom. One way to do this is to have each student have their own laptops throughout middle school years and track the results (Stoll 1998).

Wiburg (1995) concludes that computer assisted instruction and integrated learning systems both increase student motivation to do well in the classes where they are in place. However, with both programs, student success only increased with teacher involvement. If the teacher left the students to do their work on the computer without instruction and assistance, the student did the same as without the computer. Additionally, the use of
computer assisted instruction and integrated learning systems did not dramatically change student ability, while student motivation was greatly improved (students were working from bell to bell in these classes, excited to turn computers on and begin work).

Writing Education and Computers

MacArthur (1996) reviews ways in which computers can support the writing of students with learning disabilities. It discusses the benefits and the weaknesses of general types of programs, (including spelling checkers, speech synthesis, word prediction, and grammar and style checkers) as well as several specific programs on the market at the time of publication. The article also discusses the overall benefit and educational value of technology to both learning disabled students and those students without a learning disability, pointing out that teacher involvement, preparation, and guidance were bigger indicators than the software itself. The study points out that while technology can be of greater help to those student experiencing learning disabilities (especially in regards to written communication), it can be beneficial to all students when used in appropriate instances with teacher modeling and guidance.
Some of the major benefits were found in the amount and quality of revisions, especially in first drafts. Neatness of work and student pride in their work were also pointed out as motivation factors for students who were able to generate their work on word processors instead of handwriting their assignments. Since this article focused primarily on elementary learning-disabled students, further study would be indicated in middle and high school students.

In further researching the writing abilities of students from all grade levels MacArthur (1999) discusses how a variety of computer programs could assist students in overcoming the difficulties encountered with writing down their thoughts. He found that students of all ages had a decrease in the quality of their writing due to frustration levels caused by spelling problems, poor handwriting, and syntax problems (among others). His studies of word processing programs, spelling checkers, grammar checkers, speech synthesis programs, word prediction programs, and dictation/speech recognition programs found that many students were able to improve their quality and quantity of writing by having technology available (with proper training) to assist them with areas of difficulty. MacArthur also suggests that merely having
access to these programs is not helpful, but having a teacher meaningfully integrate these assists can bring up writing scores and improve both ability and comfort levels.

In Technology and Children, Vincent Childress (2004) expounds on the importance of meeting students at their interest levels in all areas, especially technology integration into all levels of education, "teaching technology is a hands-on, minds-on process that engages your students..." (p. 3). His premise is that integrating technology into any subject will increase student interest in that subject.

Sreenivasan (2004) takes this a step further specifically discussing computers and the writing process. "The art of writing lies in rewriting what you’ve already rewritten" says writing coach Mervin Block (as quoted by Sreenivasan, 2004, p. 8). Technology makes this process easier, especially with the variety of word processing programs available today. The use of computers had not only affected the ease of revision, it has also increased the amount that students are writing outside of classroom assignments. Says Sreenivasan, "now with the advent of e-mail and instant messaging, it also has to be tight, punchy, and instantly engaging . . . and kids as young as
10 pour their thoughts onto the screen for the world to read." (p. 14). The use of the computer motivates students to write more, and better, not only in the classroom, but outside of it as well.

Summary

The literature important to the project was presented in Chapter Two. The literature shows that while computers have been shown to enhance learning in a lab (one-on-one) setting, programs are still required that will address whole-class teaching situations. Additionally, several studies have shown improvements for at-risk or learning disabled students. Computers have also been shown to increase motivation in students of all levels.
CHAPTER THREE

METHODOLOGY

Introduction

Chapter Three documents the steps used in developing the project. Specifically, the researcher wanted to find out if the Merit Software program, "Write it Right" could be effective in a whole class setting (using one computer) rather than in a computer lab. The further purpose was to identify if this strategy was more effective than the use of the traditional textbook method of grammar study in the ninth grade. The researcher’s hypothesis is that use of the computer program even on a single workstation will demonstrate greater growth in student scores. With the null hypothesis there will be no difference in performance between students receiving traditional text-based language instruction and students who receive instruction via the Write it Right software. The null hypothesis will show either equal growth between the two, or greater growth through traditional methods.

Using an quasi-experimental design, the researcher had a treatment group and a control group. One group was instructed in grammar using traditional methods (control group) presented in the textbook. The other class
(treatment group) had the addition of technology as used by a teacher trained in the integration of technology into the English/Language Arts classroom. The use of technology was restricted to the single teacher computer, with the addition of an LCD projector for interaction of the class in group grammar assignments. Students in this group did not receive any traditional grammar instruction during the month the study was being conducted.

Population Served

A cluster sampling model was used, as students were selected for this study based on current enrollment in the class of the teacher conducting the research. At Palm Desert High School, after the top students of each grade level are assigned to the honors courses, the remaining students are randomly placed (by the computer and counselors) into the remaining college placement sections (i.e. there is no tracking beyond honors placement). Therefore, the students involved in this study are heterogeneously grouped according to socio-economic status (SES), gender, home language, and ability. Students involved in this study were enrolled in English I college preparation.
According to the Palm Desert High School "School Accountability Report Card" for 2002-2003 (the most recent available information), the population of Palm Desert High School is 72% Caucasian, 23% Hispanic, 4% Asian, 1% African American, and less than 1% other. The school has a 1% drop-out rate.

There are 4 computer labs on campus, two used for computer classes, two available by teacher reservation. One is designated as a "math lab," while the other is in the library, primarily used for research. Many students have computer and Internet connection available at home.

Data Collection

Students were given a pre-assessment to assess current grammar levels. This assessment was taken from the Holt Grammar textbook being utilized by the control class and consists of a paragraph with 20 separate words identified. Students are to label each identified word by their part of speech (noun, verb, adverb, adjective, conjunction, etc.). This assessment is presented in the text as a pre-test for the unit on parts of speech that was used by the control group. After completing the grammar program designed for each level, each student was given a post-test to assess growth. This test was also
taken from the Holt Grammar Handbook utilized by the control group. The post-test was set up in the same fashion as the first and is placed in the text as a post-unit assessment. Each test consisted of a paragraph where students were required to identify the part of speech of 20 pre-selected words (see Appendix B and C).

Each day, students in the control class, worked out of the English textbooks on a variety of grammar skills, focusing on parts of speech. Each section had questions for the students to complete in which they were to identify various parts of speech. This assignment was done as a "sponge-activity" each day while the teacher did classroom paperwork and attendance. Students then self-graded assignments through verbal discussion to correct mistakes and gain better understanding of the skills presented that day. This daily assignment lasted for 10-15 minutes of each class period. Once each class (both control and test groups) completed the 10-15 minute grammar lesson, the lesson plan moved onto literature analysis and other similar topics. The time allotted remained consistent each day with the teacher keeping the time.

The students in the test group used the computer software on a single classroom computer with the
assistance of the LCD projector and screen for whole class viewing. This was also done as a "sponge activity." Each day a different student was placed in charge of the keyboard and became the class spokesperson. The student assigned to the keyboard changed daily and received class input before selecting answers in the program. These students were given instant feedback by the computer program, often with a "second-chance" question.

Data Analysis

The pre and post test scores for the treatment and the control group were analyzed for the overall difference in student scores. Each class was also evaluated separately to observe individual student score changes. The standard deviation was calculated to determine the distribution of the data from the mean scores of each class. Finally, the t-value for two populations was calculated to validate or reject the null hypothesis. These calculations were made using formulas out of a statistics textbook, using Microsoft Excel to assist with the calculations.

Summary

Two classes of ninth grade students were presented with grammar lessons from two separate methods of
teaching. They were tested with the same test before the lessons began, and at the conclusion of the unit of instruction. Test scores were analyzed to show which method proved most effective.
CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

Included in Chapter Four is a presentation of the result of completing the project. The results will show that the traditional, book-based method of grammar instruction versus the utilization of a technology based grammar instruction tool were not, in isolation, effective strategies for students' mastery of grammar. Several factors may have caused this, one being that the method of assessment (paragraph) was different from the method of instruction in both instances (single sentences). Another reason could be attributed to test anxiety and/or disinterest in the subject matter (not as likely, however). There may well have been teacher fault as well, as Wiburg (1995) states, if the teacher left the students to do their work on the computer without instruction and assistance, the student did the same as without the computer. Students were involved in whole class study, as prescribed by the program, but the removal of the teacher from the process may have adversely affected scores and achievement.
While whole class results were poor, there were individual students who showed varying degrees of improvement. Theoretically demonstrating that depending on learning styles, either of these methods could be effective.

Presentation of the Findings

Data taken from the pre and post tests of each group was compiled into a Microsoft Excel spreadsheet in order to facilitate the use of formulas and the creation of the tables and graphs. Data was then compared to discover the following impressions.

Table 1 (Control Group Pre and Post Test Results) compiles the raw data as well as the percentage score on pre and post tests for students in the control group. The class mean pretest score was 44%, the mean post test score was 38%, the mean percent of change from pre to post test was -4%. The scores for this set of students, on average, decreased, demonstrating that this method was ineffective.
**Table 1. Control Group Pre and Post Test Results**

<table>
<thead>
<tr>
<th>Student Number</th>
<th>Pre-test (20 points possible)</th>
<th>Post-test (20 points possible)</th>
<th>Difference</th>
<th>Percent Pretest</th>
<th>Percent Post-Test</th>
<th>Percent Change</th>
</tr>
</thead>
<tbody>
<tr>
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<td>-4</td>
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<tr>
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<td>0%</td>
</tr>
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<td>20%</td>
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</tr>
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</tr>
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<td>1</td>
<td>20%</td>
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**Class Mean Scores**

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</thead>
<tbody>
<tr>
<td>-4%</td>
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<td>.14</td>
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</tbody>
</table>
Table 2 (Treatment Group Pre and Post Test Results) compiles the raw data as well as the percentage score on pre and post tests for students in the treatment group. The class mean pretest score was 45%, the mean post test score was 34%, the mean percent of change from pre to post test was -11%. The scores for this set of students, on average, decreased, demonstrating that this method was ineffective.

<table>
<thead>
<tr>
<th>Student Number</th>
<th>Pre-test (20 points possible)</th>
<th>Post-test (20 points possible)</th>
<th>Difference</th>
<th>Percent Pre-test</th>
<th>Percent Post-Test</th>
<th>Percent Change</th>
</tr>
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<td>10%</td>
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<td>-4</td>
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<td>5%</td>
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<td>-20%</td>
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<td>665-643</td>
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<td>60%</td>
<td>35%</td>
<td>-25%</td>
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<td>917-950</td>
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<td>8</td>
<td>-4</td>
<td>60%</td>
<td>40%</td>
<td>-20%</td>
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<td>9</td>
<td>-3</td>
<td>60%</td>
<td>45%</td>
<td>-15%</td>
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<tr>
<td></td>
<td>Pre-Test</td>
<td>Post-Test</td>
<td>Mean Difference</td>
<td>Diff SD</td>
<td></td>
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</tr>
<tr>
<td>------</td>
<td>----------</td>
<td>-----------</td>
<td>-----------------</td>
<td>--------</td>
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<td>Class Mean Scores</td>
<td>45</td>
<td>34</td>
<td>-11%</td>
<td>14%</td>
<td></td>
<td></td>
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<td>Standard Deviation</td>
<td>.18</td>
<td>.17</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 1 (Control Group Distribution Graph) shows the pre and post test distribution of student scores in the control group. The chart illustrates that only 3 students scored at or above 70% on the pre-test, with only 1 student in this range on the post-test. The total number of students performing in the traditional “pass” range (70% or above) decreased at the administration of the post-test.
Figure 1. Control Group Distribution

Figure 2 (Treatment Group Distribution Graph) shows the pre and post test distribution of student scores in the treatment group. The chart illustrates that only 3 students scored at or above 70% on the pre-test, with only 2 students in this range on the post-test. Again, the number of students performing in the pass range decreased.
Figure 2. Treatment Group Distribution

Figure 3 (Control and Treatment Group Comparison Graph) shows a comparison of pre and post tests for both groups of students in each decile from 0-100. Most students fell between the decile bands of 20-29 and 50-59. Students performed poorly in each class, with the grammar instruction making little difference according to type of instruction.
Analysis of the data shows that students did not gain sufficient mastery of the grammar skills presented using either method of instruction. Rather, they demonstrate that students display a decrease in skill mastery; those students using the computer technology had a greater decrease in skill mastery. This is evidenced by the mean difference obtained between pre and post test scores of the control group of -4% and the treatment group of -11%.

The outcome of the application of the t-test was the retention of the null hypothesis ($H_0:X_1=X_2$) when comparing
the percent of change between traditional pre and post tests (for the class receiving traditional instruction) versus the percent of change between test group pre and post tests (students received instruction via Merit software on a single computer). The t-value is 2.59 with 60 degrees of freedom, which falls between two values: 2.39 (98th percentile) and 2.66 (99th percentile). Both are below the 5% cutoff required to reject the null hypothesis when using the t-test.

The original hypothesis was not proven by the data, meaning students in computer-based instruction did not perform better than students with textbook instruction. In fact, data illustrates that students in both modes of instruction did poorly. However, a small number of students in each class did show improvement. In the control group, 9 students showed a positive percentage change (table 1). There were 34 students in this class, showing that 26% of the students showed growth. In the treatment group, 6 students showed a positive percentage change (table 2). There were 29 students in this class, showing that 21% of the students showed growth. This data implies that the textbook instruction was more effective that the computer-based instruction with 3 more students (4%) improving their overall scores. Again, many factors
could be at work here. The computer program was designed for a computer lab (each student with their own computer) system, students were tested using a different method than they were taught (by paragraph, not sentence by sentence), and some students test poorly due to test anxiety.

Research shows that “the role of teachers is crucial in evaluating the effectiveness of technology in schools, but the burden of proof is not solely theirs” (McNabb 1999). In this instance, the outcome of this study lends support that Merit Software might be better suited for lab settings as accorded in the product description (appendix A) rather than the classroom setting in which it was applied with a single workstation.

While technology has been shown to increase student motivation (Simpson 2001), this does not appear to be supported in this instance. However, according to the federal report “Teachers and technology: making the connection” (1995), technology is not the “panacea” for all education, but a tool that can assist students be more accomplished learners with proper implementation and support. Waxman and Huang (1997), in their studies on the effect of technology on student motivation, anxiety, and classroom learning, showed that in classes where technology was often used, students had higher
involvement, satisfaction, and motivation. And in math classrooms, it was shown that technology use lowered math anxiety and increased satisfaction more than other classes. Students candid reports in this study showed that they enjoyed the computer program more than the textbook, even if it did not enhance overall understanding as presented.

David (1991) discusses that the use of technology within the existing teaching styles will not lead to major changes in learning. This claim is supported by this teacher’s study, demonstrating that simply inserting the technology without changing class structure makes little to no difference in student achievement. While this current study did not have encouraging results, McKenzie (2001) supports the exploration of new technologies in the classroom because, the use of these new tools to help student’s master key concepts and skills can make a difference in daily practice translating into stronger student performance.

The subjective findings of this study, as determined by candid comments and observed attitudes are supported by Wiburg (1995) who concluded that computer assisted instruction increases student motivation. However, student success only increased with student involvement.
Without teacher assistance, the student did the same as without the computer. Additionally Wiburg states that while the use of computer assisted instruction did not dramatically change student ability, student motivation was greatly improved. MacArthur (1999) suggests that merely having access to computer programs is not helpful, but having a teacher meaningfully integrate these programs can improve both ability and comfort with content material.

Summary

Overall, student performance on the post-test was poor in both the control and treatment groups, indicated by negative growth in the classes mean score percentage change. The null hypothesis was retained.
CHAPTER FIVE

CONCLUSIONS AND RECOMMENDATIONS

Introduction

Included in Chapter Five is a presentation of the conclusions gleaned as a result of completing the project. Further, the recommendations extracted from the project are presented.

Conclusions

The conclusions extracted from the project follows.

1. Most students did not improve with the computer based approach to grammar instruction. The average of the scores decreased, as demonstrated in chapter four. However, some student scores did improve, demonstrating that for some students, the use of the computer was effective.

2. Most students did not improve with the text book approach to grammar instruction. The average of the scores also decreased, as demonstrated in chapter four. However, some student scores did improve, demonstrating that for some students, this use of the text book was effective.
Recommendations

The recommendations resulting from the project follows.

1. Computer-based learning should be limited to a computer lab, where each student has access to a workstation. Studies discussed in the literature review demonstrate the success of this practice. The ability to interact one on one with the text and the software will help students to improve their skills by increased ownership in the process (they are in charge of what answers are used, and don’t have to rely on another students decision).

2. More integration of grammar instruction into all areas of the language arts should be explored to allow for greater retention (rather than teaching grammar in isolation as was done here).

Numerous studies (both formal and informal) have shown that teaching grammar as part of the literature study or writing process is more effective. Students should see what good grammar looks like (not just the rules) and be able to apply those skills immediately into their own writing process.
3. Further research should include ability level pairing of students for more accurate and reliable comparison of data. The cluster sampling model used for this study was necessitated by the structure of the teachers current classroom setting. However, more authentic research should be conducted using students of equal ability levels at the start of the study.

Summary

Grammar instruction in isolation was not effective in either mode. Computer based learning for whole class instruction was found to be ineffective and in some cases detrimental. Computer based learning should be used in modern education, however, programs should only be used as prescribed by the publishers. Taking something intended for one on one interaction and forcing group interaction is ineffective.

Many factors were involved in the poor results of this study. Issues such as poor attendance and participation, lack of interest since grades were not involved, and an overall feeling of “apathy” by this particular group of students are all contributing factors.
It is the researchers opinion, that when used in the correct setting, with students that are motivated to learn, the software could be very effective.
APPENDIX A

SOFTWARE DESCRIPTION
Software Description

The program helps students learn to correct common problems in writing, including faulty sentence structure, unclear meaning, misplaced modifiers, and grammatical shifts. Each text contains errors. Students may view what each possible correction looks like in the text before entering the one of their choice. Each set contains 63 texts and 126 questions.

The program consists of four units, with 28 texts in units 1, 2, 3, and 35 texts in unit 4. Texts are arranged in primary writing problem groups. Each text contains sentences with errors and a choice of ways to correct them. A list of all skills in the program appears at the end of this document. Each lesson is self-directing and self-correcting. Students receive graphic rewards. Following each round on the summary screen is a Print option, which generates a progress-to-date report. Student scores are kept in a management system that allows teachers to view and print reports.

There are several program features the teacher may customize for the students. See the TPM section of this guide for information.

1. Hide/Show Sound
2. Hide/Show Graphics
3. Set the number of correct answers needed to pass each part
4. Set the number of texts presented for each part

PROGRAM DESCRIPTION

Each unit of the program contains four MAIN MENU parts: Tryout, Warm-up, Workout, and Finals. The program is pre-set, with the numbers entered in the parts listed below. Summary screens follow each part of the Main Menu. The Print option shows the student's progress to date, not just the results of an individual round.

TRYOUT: Presents all skills in the same order in which they are listed in the program guide. The student will be given four texts for each skill in this unit. There is more than one writing problem per text, but only one will be highlighted for the student to correct. To pass a skill, he must make correct choices for three texts. The bar at the bottom of the screen shows how much of the Tryout the student has completed.

Summary-Tryout: When the student has finished all the questions, a summary screen will show how he did. A check next to a skill lets the student know he has passed. The skills that he passes in this part will also be shown as passed in the Warm-up.

WARM-UP: The student will have a chance to practice one skill per round. Help messages, as well as sound and graphic rewards, are available. Two sentences in each text are highlighted, one at a time. One sentence contains the primary writing problem the student selected. A second sentence contains a common grammatical error. For the Review section, the problems are a random mixture of primary writing errors and common grammatical errors. A View option allows the student to see what each possible correction looks like in the text before he enters his choice. To pass any text, the student must correct both sentences. To pass each skill, the student must correct four texts. The bar at the bottom of the screen will show how far along the student is in the round. Checks on the Warm-up menu indicate the skills that the student has passed, either in the Tryout or in the Warm-up.

Summary-Warm-up: The student gets a star for each text in which he has corrected both errors. He gets half credit for answering correctly on the second try. When the student
gets four stars in a skill area, he gets a check that shows him he has passed. The bar at the bottom of the screen indicates how many skills the student has passed in the Warm-up.

**WORKOUT:** The student will be challenged to use all skills presented in random order. Help messages, as well as sound and graphic rewards, are available. To complete the Workout, the student needs to play at least five rounds, each containing five randomly selected texts from several skill areas. Two sentences in each text are highlighted, one at a time. One sentence contains a primary writing problem. A second sentence contains a common grammatical error. A View option allows the student to see what each possible correction looks like in the text before he enters his choice. To pass any text, the student must correct both sentences. To pass the Workout, the student must make five correct choices for each skill. When the student has accumulated five stars in each primary writing skill area, he will be given a Review, which will complete the Workout. The bar at the bottom of the screen first shows how far along the student is in the Workout and then indicates how far along he is in the current round.

**Review (follows the Workout):** In the Review, two sentences in each text are highlighted, one at a time.

The problems are a random mixture of primary writing errors and common grammatical errors. To pass a text, the student must correct both sentences. When the student passes four texts, he has passed the Review. When the student completes the Review, he has passed the Workout.

**Summary-Workout:** At the end of each round a summary screen will show how the student did. The student gets a star for each correct answer. He gets half credit for answering correctly on the second try. Red stars show correct answers for the current round. Gray stars show correct answers for preceding rounds. When the student has five stars in a skill area, he has passed it. When he has gotten five stars in all skill areas, he has finished the Workout. The bar at the bottom of the screen indicates how many skills the student has passed in the Workout.

**FINALS:** The student will be given four texts for each skill. To pass a skill, he must make at least three correct choices. The bar at the bottom of the screen shows how much of the Finals he has completed.

**Summary-Finals:** When the student has finished all the questions, a summary screen will show how he did. A check next to a skill lets the student know he has passed.

**PROGRAM HELP FEATURES**

The program provides three help features. First, the Warm-up, individual skill drill, gives the student the opportunity to focus on a specific skill. A check next to a skill on the Warm-up menu indicates that the student has mastered that skill. Checked skills may be chosen for additional drill. Second, for the Warm-up and the Workout, a View option allows the student to see what each possible correction looks like in the text before he enters his choice. Third, the computer gives the reason(s) for the correct answer.

**HOME VERSION**

A Home version of the program provides additional flexibility. It is appropriate for:

- Teachers who wish to assign independent work for students
- Teachers who teach distance learning programs
- Self-motivated people interested in improving their skills
- Home school settings
The Home version has the same scope, sequence, and printing features as the School versions. It tracks and bookmarks the work of two students, but it does not permit user entry into the teacher record management system.

To facilitate distance learning, each time a student completes a round, a progress report is automatically saved as a file that may be e-mailed to an instructor. This progress-to-date file has an MPR extension and contains the same information a student gets when he prints from the summary screen. Student access to this file is through the Progress Reports folder in the Start menu of the Home version.

Students may purchase Home versions of the software directly from Merit.

HOME VERSION PROGRESS REPORT VIEWER
The School versions do not generate MPR files but they contain a Viewer program. When you double-click the Home version MPR progress-to-date file on a system that has a School version of the program installed, the file will open in a password-protected Viewer program. Type the password in the password box and press OK. You will be alerted if the file has been altered. If it is unaltered, you may view or print it out from the Viewer program. The progress-to-date file can also be opened with the Windows system Notepad or Wordpad programs, but these programs will not notify you if the file has been altered.

EVALUATION VERSION NOTE
The Evaluation version of the software includes the Viewer program and, for convenience, automatically saves the MPR progress-to-date file at the end of each round. MPR files can be accessed through the Progress Reports folder in the Start menu.

LOGGING ON AND CLASS MANAGEMENT
We suggest that teachers set up their class codes before the students log on to the program for the first time. Type the password in the password box and press OK. For more information about class management see The Teacher Program Manager manual. It can be printed out from the Software Documentation section of the Merit Software Installation CD.

The program opens to a Log on screen with all previously entered class codes and student names.
Students must select their class code in order to see the list of students in their class. They then click on their name to begin the program. If they are logging on for the first time, students select their class code, click the New Student icon, and fill in their name on the form that appears on the screen. The evaluation version of the program permits entry of only two student names. When a third name is entered, the first one will be deleted. The stand-alone version for one station contains record keeping for 42 students. Other School versions permit entry of as many names as disk space allows. When disk space is filled, the name that was entered first will be deleted.

SCORING
Students may print out their scores at the end of round progress-to-date screen. Teachers may view detailed scoring in the Teacher Program Manager.

TEACHER PROGRAM MANAGER
All Merit Software applications utilize a centralized student record keeping/management system utility program called Teacher Program Manager (TPM). To learn about these advanced functions, see the Teacher Program Manager manual. It can be printed out from the Software Documentation section of the Merit Software Installation CD.
Set 2, Write It Right (Contains Units 3 and 4)

Unit 3
1. Parallel structure II
2. Fused sentences
3. Unclear pronoun reference
4. Repetition
5. Mixed practice review III

Unit 4
1. Dangling modifier
2. Parallel structure III
3. Shift in voice
4. Misplaced modifier: clause
5. Shift in tense
6. Mixed practice review IV

Other errors (common grammatical errors appearing throughout the units)
1. Agreement of subject and verb
2. Usage
3. Unclear meaning
4. Agreement of pronoun and antecedent
5. Adverb/adjacent confusion
6. Double negative
7. Plural/possessive confusion
8. Wrong verb form
9. Misused preposition
10. Comparative form of adjectives
11. Spelling
APPENDIX B

GRAMMAR PRE-TEST
Pre-Test Identifying Parts of Speech Exam

Identify the part of speech for each italicized word in the following paragraph: (the 8 parts of speech are: noun, verb, pronoun, adverb, adjective, preposition, conjunction, interjection).

For (1) me, no (2) spot is (3) better than the beach. On (4) hot, sunny days, when the sand (5) burns my feet, I am always (6) careful (7) about putting on (8) sunscreen. I like to run through the foaming surf and later relax under a beach umbrella.

Most of the time, I (10) enjoy being with friends, (11) but sometimes I prefer to be by (12) myself. With only (13) strangers around me, I (14) feel free to think my (15) own thoughts. I wander (16) slowly along the shore, poking through all the interesting things (17) that the sea has washed up. Once I accidentally stepped on a (18) jelly-fish and couldn’t help but yell (19) “Ouch!” when it stung my foot. Since then, I’ve learned to be (20) more careful about where I step.
APPENDIX C

GRAMMAR POST-TEST
Post-Test: Identifying Parts of Speech Exam

Identify the part of speech for each italicized word in the following paragraph: (the 8 parts of speech are: noun, verb, pronoun, adverb, adjective, preposition, conjunction, interjection).

The (1) **first** pioneers on the Great Plains (2) **encountered** many kinds (3) **of** dangerous animals. Grizzly bears and (4) **huge** herds of bison were menaces to (5) **early** settlers. One of the (6) **most** ferocious beasts of the plains (7) **was** a (8) **grizzly** protecting her cubs. However, (9) **neither** the bison nor the grizzly was the most feared animal (10) **on** the frontier. (11) **None** of the other prairie creatures – not even the deadly (12) **rattlesnake** – were dreaded so much as the skunk. You may think, (13) “**Oh**, that is (14) **ridiculous,**” (15) **yet** it is true.

Skunks were not feared because they (16) **smelled** bad but, instead, because they (17) **often** carried (18) **rabies**. Since there was no vaccine for rabies in (19) **those** days, the bite of a rabid skunk spelled certain (20) **doom** for the unlucky victim.
APPENDIX D

IRB APPROVAL
May 5, 2003

Ms. Cynthia JoAnn Furr
c/o: Prof. Eun-Ok Baek
College of Education
Department of Science, Math, & Technology
California State University
5500 University Parkway
San Bernardino, California 92407

Dear Ms. Furr:

Your application to use human subjects, titled, “Single Workstation Use in the Language Arts Classroom” has been reviewed and approved by the Institutional Review Board (IRB). Your informed consent statement should contain a statement that reads, “This research has been reviewed and approved by the Institutional Review Board of California State University, San Bernardino.”

Please notify the IRB if any substantive changes are made in your research prospectus and/or any unanticipated risks to subjects arise. If your project lasts longer than one year, you must reapply of approval at the end of each year. You are required to keep copies of the informed consent forms and data for at least three years.

If you have any questions regarding the IRB decision, please contact Michael Gillespie, IRB Secretary. Mr. Gillespie can be reached by phone at (909) 880-5027, by fax at (909) 880-7028, or by email at mgillesp@csusb.edu. Please include your application identification number (above) in all correspondence.

Best of luck with your research.

Sincerely,

Joseph Lovett, Chair,
Institutional Review Board

cc: Prof. Eun-Ok Baek, Department of Science, Math, & Technology
APPENDIX E

INFORMED CONSENT
STUDY OF COMPUTER-USE IN GRAMMAR INSTRUCTION
INFORMED CONSENT

The study in which you are about to participate is designed to investigate the use of Merit Software to improve grammar. This study is being conducted by Ms. Cyndi Furr under the supervision of Dr. Eun-Ok Baek, PROFESSOR OF Instructional Technology. This study has been approved by the Institutional Review Board, California State University, San Bernardino. The University requires that you give your consent before participating in this study.

In this study you will be asked to take two tests and utilize the Merit Software as presented in during classroom instruction. All of your responses will be held in the strictest of confidence by the researcher. Your name will not be reported with your responses. All data will be reported in group form only. You may receive the group results of this study upon completion in the Spring Quarter of 2005.

Your participation in this study is totally voluntary. You are free to withdraw at any time during this study without penalty. When you complete the task, you will receive a debriefing statement describing the study in more detail. In order to ensure to validity of the study, we ask you not to discuss this study with other students.

If you have any questions or concerns about this study, please feel free to contact Ms. Cyndi Furr or Professor Eun-Ok Baek at (909) 880-5454.

By placing a check mark in the box below, I acknowledge that I have been informed of, and that I understand, the nature and purpose of this study, and I freely consent to participate. I also acknowledge that I am at least 18 years of age.

Place a check mark here □

Today's date: ____________
REFERENCES


Sreenivasan, S. (2004). Words online: how technology is changing the written word. Writing, Nov/Dec, 8-13


