

THE EFFECTS OF THE *WRITING TO WIN PROGRAM* ON HIGH SCHOOL SCIENCE
ACHIEVEMENT

by

DOLORES BROWN BYRNE

(Under the Direction of C. Thomas Holmes)

ABSTRACT

This study explored the teaching of secondary writing achievement across the physical science curriculum using Combs' *Writing to Win Program*. Two high school physical science classes were taught writing strategies, and two classes were not. Pretests and posttests were administered to all four classes in the study to determine the effectiveness of the *Writing to Win Program* on physical science achievement. Data from both tests were analyzed and compared to determine the effects of the *Writing to Win* strategies on physical science achievement. The students who were exposed to writing strategies achieved higher scores on a teacher-made test of physical science than those who were not taught writing strategies. No statistical differences were found between males and females or black and white students.

INDEX WORDS: Secondary writing, *Writing to Win*, Teaching writing, Physical science, Across the curriculum.

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DEDICATION

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CHAPTER ONE

TEACHING WRITING

Introduction

There is an academic crisis in our high schools today. According to the *National Commission on Writing (2003)*, high schools are in critical need of academic reform. As indicated from recent data from *Because Writing Matters* (Nagin, 2003), many types of academic reforms are challenging high schools in recent years. Of the three most critical subjects needing reform (reading, writing, and mathematics), writing was stated as the most neglected (National Commission on Writing, 2003). The Commission further stated that with all the emphasis on reading and mathematics, there were serious shortages of time and resources available to devote to writing.

Academic achievement at the high school level needs to be improved, and the dropout rate reduced in order for high schools to meet the stringent testing mandates for reading, writing, and mathematics required by the federal act, No Child Left Behind (NCLB), 2002. Pushed aside for reading and mathematics in the past, writing reform is moving to the center of the educational stream (Hurwitz & Hurwitz, 2004). According to Hurwitz, the July 2003 NAEP scores showed only 24 % of high school seniors were proficient in writing. He also emphasized that there was a critical writing crisis today. Darwin and Fleashman (2005) agreed with Hurwitz that, “Recent data indicate that adolescents in the United States are not keeping pace with current literary demands. These data also underscore disparities among racial and ethnic groups and among students from different socioeconomic levels” (p. 85).

Purpose of the Study

This study was designed to determine if there was a significant relationship between physical science achievement results of one group exposed to the implementation of the *Writing to Win Program's* (Combs, 1986) writing strategies and another group that was not exposed to the writing strategies. The study was further designed to examine if the writing strategies improved high school students' physical science achievement in a nine weeks course of study. Several sources indicated that writing instruction is severely lacking at the secondary level. This lack of performance concerns educators as research has indicated that students need to write more effectively than ever (National Commission on Writing, 2003). Hurwitz and Hurwitz (2004) firmly emphasized, "Increasingly, decision makers are recognizing that effective writing is fundamental to learning and communication and therefore vital to success in education and the workplace" (p. 17).

Statement of the Problem

Data show that students are not meeting the minimum writing expectations of the *No Child Left Behind Act* (NCLB, 2002). Secondary students throughout the United States are currently experiencing educational reform at many levels. Present secondary schools are more accountable than before for students' meeting the higher standards expected from federal and state mandates. High schools today are not meeting the high expectations of the NCLB in writing. The NAEP (2003) revealed alarming statistics about United States student writers, "Four out of five United States students in grades 4, 8, and 12 score at or above basic writing. Only 22 percent of seniors achieve at or above the proficient level" (p. 16). Denti (2004) stated that the National Center for Educational Statistics (NCES, 1998) indicated that over 66% of eighth grade students and 50% of students in grade 12 were below proficiency level in reading (p. 109).

Pasconella (2004) stated:

Only about 70 percent of all United States students graduate from high school and only 32 percent of them are college-ready. And roughly about 70 percent of all new jobs require at least some degree of post-secondary education, according to the Bureau of Labor Statistics. Furthermore, only 20 percent of black students are ready to go to college and only about 16 percent of Hispanic students are ready, according to figures from Jay Greene at the Manhattan Institute. (p. 54)

Students with a high school diploma have more career and educational opportunities, and earn significantly more money than peers that dropout (Levy & Murmane, 2004). They further emphasized,

An education centered on complex thinking and communicating is a graduate's passport to prosperity. The great danger is the continuing decline in earnings opportunities for people who lack the skills to do work requiring expert thinking and complex communication... complex, technical skills will be necessary for the new century's jobs. (p. 80)

In addition, Levy and Murmane (2004) further concluded,

The categories in which jobs are declining have historically provided work to the majority of the United States high school graduates who do not go on to college. (p. 81)

The National Center for Education Statistics-U.S. Department of Education (2003), agreed stating that,

In the business world, as well as in school, students must convey complex ideas and information in a clear, succinct manner. Inadequate writing skills, therefore, could inhibit achievement across the curriculum and in future careers, while proficient writing skills help students convey ideas, deliver instructions, analyze information, and motivate others. (p. 70)

Background

The Writing to Win Program is a writing program designed to provide students with writing skills necessary to successfully graduate from high school by passing the GHS GT. This program was introduced in 1980. Forty school districts in Georgia, three in South Carolina, and two in Florida adopted the program in 1992. The program has recently spread into Ohio,

Tennessee, and South Dakota. *The Writing to Win Program* (Combs, 1986) is a management system designed to improve writing in the K-12 schools. This program was introduced to the school system cited in this study, a small middle Georgia school system, at the elementary schools in 2000. It was first introduced as a pilot program, and then to all classes teaching writing at the kindergarten through fifth grade level. In the fall of 2004, this program was introduced in this system at the only middle school at the sixth grade level and at the only high school in all social studies and language arts classes. In the fall of 2005, the *Writing to Win Program* was extended to the science and math teachers with instructional strategies implemented in January of 2006 to some science and math classes and at the middle school level in the seventh grades.

Social studies and language arts teachers at the high school were introduced to this writing program prior to the 2004-05 school year. Teachers spent two days in staff development learning the program's writing strategies. After the staff development, teachers taught the *Writing to Win Program* to all English and social studies classes at the high school, even the special education classes that taught language arts and social studies. The math and science teachers were added in 2005-2006 at the high school level and were trained on the writing strategies. At the middle school level, the seventh grade classes were added to the sixth grade classes in receiving writing instruction. Next year, the middle school will train the eighth grade teachers, and all students in the building will be exposed to the writing strategies. Earlier instruction in *Writing to Win* provided effective writing instruction to students as they transfer up to the high school in providing consistent, building, knowledge and exposure of the strategies.

Teaching writing has changed over the years as more research has revealed what strategies were most effective in teaching writing to high school students. In the past, writing

generally consisted of writing an essay or term paper on a given topic. Before, the emphasis on writing mostly consisted of the proper use of grammar and punctuation mechanics, not the writing process itself. As stated by Unger and Fleischman (2004),

Generally, our writing consisted of essays about literature, which a teacher marked for errors, graded, and returned. Instruction in grammar and writing conventions usually took place separate, unrelated to the writing we did. (p. 90)

Expectations of high school student writers are greater today than ever before. Students must write expressively to advance from high school prepared for life's challenges (*The National Commission on Writing, 2004*). Writing was often taught across the curriculum in all subjects. This paper focused on writing across the discipline of science. Researchers have presented effective strategies to teach writing instruction. More information on how to write effectively is now available to guide teachers and students on the skills of writing.

Justification of the Study

Because students today are not meeting state and federal requirements on writing tests, more high schools are emphasizing the teaching of writing. According to data presented by Hurwitz (2004), a critical writing crisis exists today in the nation's schools for these reasons:

- Most students are poor writers. According to the July 2003, NAEP test scores, fewer than one in three of the United States' fourth, eighth, and twelfth graders are proficient in writing. Only 24 percent of high school seniors are "capable of composing organized, coherent prose in clear language with correct spelling and grammar.
- Teachers themselves lack writing skills. Few of the nation's teachers are trained in teaching writing. Very few of the states require teachers to take courses in writing to be certified to teach. Not many professional staff development classes have been available for teachers to learn how to teach writing.
- Students rarely receive rigorous writing assignments. NAEP reports that only 49 percent of high school seniors are assigned three pages or more of writing assignments for English class, and these only once or twice a month. Elementary students only spend three hours a week or less on writing assignments.

- Employers and college professors have been concerned about the quality of writing among their new employees and students. More than 70 percent of employees in a 2002 Public Agenda survey who were recent high school graduates and college teachers of freshmen and sophomores rated high school graduate as “fair” or “poor” on writing skills. (p. 7)

In Georgia, students take state writing tests at grades 3, 5, 8, and 11. To graduate from a Georgia high school, students must pass the Georgia High School Graduation Writing Test given in the eleventh grade. (See Appendix A.). One of the problems with Georgia high school students is that many students cannot pass the High School Graduation Tests in Writing and in other content areas such as in science. Baldwin (2004), stated that in addition to the mandated state tests, the Scholastic Aptitude Test (SAT) and the Atlantic College Test (ACT), recognizing the significance of writing on college success, incorporated a writing portion into their college entrance tests in 2005 (p. 72). Although writing tests appear to be here to stay, Toppo (2005) worried that the SAT writing test could backfire and be used improperly for placement once it is admitted. Shosh and Zales (2005) expressed concern on NCLB’s (2001) focus on testing. They stated that:

Teachers and teacher educators conducting practitioner research on writing in the teacher inquiry support group that we lead are attempting to place fears of high-states testing aside as they systematically examine and reflect on their teaching and their students’ learning. Through their action research inquires, these teachers are investigating innovative teaching methods that promote the higher-order thinking skills that result in genuine student achievement. (p.77)

Also, Shosh and Zales (2005) promote writing by teachers telling them to make instructional decisions based on educational research, to ensure achievement and student engagement. They suggested analyzing the data and make meaningful changes in their classroom practice. Finally, they suggested that teachers share with each other in dialogue to lead to further professional development. These authors supported authentic, inquiry-based writing as described by Hillocks.

According to Fleming (2003), “Some form of communication needs to be developed between secondary and post-secondary educators” (p. 199). More transition needed to occur. Post secondary teachers placed more emphasis on grammar and spelling than placed by the high school teachers.

Students are increasingly required to explain themselves or communicate in written form. Large numbers of students are not able to express themselves in formal written language. One program to improve the writing of high school students is the *Writing to Win Program*. This program teaches students to express themselves by developing their writing skills. Improved writing expression is linked to the improvement of critical thinking skills. Raising student achievement is the biggest challenge facing high schools today. High school reform is urgently needed as noted by the Educational Trust (2002), and the National Education Association (2001) especially in high schools where there is a high minority and poverty level.

The Components of the Writing to Win Program

The *Writing to Win Program* (Combs, 1986) introduced the following three components to improve writing:

Journal Writing – This component’s goal is to meet state and national standards by expanding journal writing to include seven strategies for critical thinking and a self-check system that allows students to earn the grade they wish for short writing even across the curriculum in social studies.

Process Writing – This component helps teachers exceed national and state standards of writing for each step of the writing projects called Writing Cycles. The Writing Cycle log and evaluation rubrics are easy for students to understand and use.

Sentence Building – This component teaches standard English grammar inductively when grammar skills studied transfer to students’ independent writing. This reflects thirty -five years of sentence combining research. The program component is designed to show 2-5 years’ growth in language improvement in one year (Combs, 1986).

An administrative tool, also by Combs, *Monitoring the Progress of Young Writers*, organized the administration of the three components. This tool assured that continuity in the administration of this program would lead to equally successful school sites. This tool was used at the high school. This study examined the writing achievement of students who had received the writing strategies from the *Writing to Win Program*.

Research Question

This study was guided by the research question--How effective was the *Writing to Win Program* in improving academic science achievement and teaching the writing skills to high school physical science students?

Significance of the Study

The Georgia State Department of Education notified the selected high school in this study that it had not achieved Annual Yearly Progress (AYP) in 2004 since the school had not met certain academic criteria for the past two years. That is, the school did not make AYP because it did not make annual yearly progress for two consecutive years in mathematics, and one year of language arts. A Georgia state consultant was provided to assist the high school in meeting its goals in the future. There was a total school commitment to improve academically, especially in math, and in language arts with an emphasis on writing. *The Writing to Win Program* was used at grades K-5 with some success, so it was introduced at the 6th grade level at the only middle school and at the only high school in the following subjects—language arts writing and social

studies. The plan was to evaluate the program in these subjects and to expand the program to science and math the next year. In 2005-2006, teachers in science and math were trained on the *Writing to Win Program* at the high school level. In January 2006, students were exposed to the *Writing to Win Program* in science in selected classes at the high school level.

Because students are increasingly required to explain themselves or communicate in written form, writing has increased in importance. Large numbers of students are not able to express themselves in formal written language. One program to improve the writing of high school students is the *Writing to Win Program*. This program teaches students to express themselves by developing their writing skills. Improved writing expression is linked to the improvement of critical thinking skills. More extensive attention to writing across the curriculum has been effective in content subject learning. Chinn and Hilgers (2000) stated that, "Writing plays a role in science much as mathematics does" (p.77). According to Hartman and Glasgow (2002), writing's role within your classroom's instructional practices might be characterized in one or more of the following ways:

- Writing activities involve realistic assignments that link classroom learning to professional utility, involve an audience other than the instructor, and require frequent interaction among students and between students and instructor.
- Writing is emphasized as a multipurpose tool for communicating and for learning content and literature relevant to the discipline.
- Assignments involve collaborative research and writing, and often take the form of major research projects culminating in oral presentations. Scientists collaborate, construct, and modify scientific knowledge.
- Critical peer review is routine, as it is within the science and engineering disciplines. Peer assessment and evaluation provide both writer and reviewer with opportunities to make sense of science content and process. (p. 77)

College entrance exams such as the SAT and ACT have recognized the significance of writing on college success and have added a writing component to their tests.

Raising student achievement is the biggest challenge facing high schools today. High school reform is urgently needed as noted by the Educational Trust (2002) and the National Education Association (2001) in the *Newsletter* (2005) especially at the high schools such as the high school in this study where there is a high poverty level. Berends (2004) related that the United States is falling behind in the international economic competition and the educational system received much of the blame.

Limitations of the Study

One limitation of this study was that the study took place in one school district and at only one high school. Another limitation was the short length of time of the study, which was based over a nine weeks' period. Next, only two teachers participated in this study. One trained on the *Writing to Win* strategies and one not trained. Finally, the study was limited in the number of students involved, only four physical science classes or 91 students participated.

Overview of the Research Procedures

The research design was a two group, pretest-posttest design (Campbell & Stanley, 1963). The teachers involved were high school science teachers, one who was trained on the *Writing to Win Program* at the selected high school, and one who was not trained in the program. Students from two physical science classes were exposed to the *Writing to Win* strategies by a *Writing to Win* trained physical science teacher. Students from two comparable physical science classes were not exposed to the strategies and were not taught by a *Writing to Win* teacher. A pretest and posttest were given, and the test results of both groups were compared.

Organization of the Study

Chapter One presented an introduction of the study followed by the purpose of the study, statement of the problem, background, justification of the study, the components of the *Writing to Win Program*, the research question, limitations of the study, the overview of the research procedures, and the organization of the study.

Chapter Two consisted of a review of selected literature related to the teaching of writing. This review included the following sections: introduction, *Writing to Win* strategies (journal writing, process writing, peer evaluation, and revision), writing assessment, writing across the curriculum, technology, writing with special needs students, and teachers' roles. An emphasis was placed on writing across the science curriculum.

Chapter Three explained the design of the study such as the data collection procedures and the methods of analyzing data including the dependent and independent variables, null hypothesis, research question, sample, instrumentation, and methods.

Chapter Four reported the findings of the study.

Chapter Five provided a summary discussion of the results including the implications for school writing improvement and the reflections for future research especially in the area of writing across the discipline of science.

CHAPTER TWO

REVIEW OF THE RELATED RESEARCH

Introduction

Putting writing before reading was an effective approach to learning and teaching (Elbow, 2004). He stated that far-reaching change happened in the way that writing was being taught even in the early grades. Students wrote (in their own spelling) what they said and then read it back. He further stated that, “The process of writing helps children comprehend written language and control letters of texts, an understanding that they need for reading...They realize that books are products of people like themselves trying to communicate with other people like themselves” (p. 8).

Nagin (2003) began chapter one of his book, *Because Writing Matters*, by stating that writing is complex and so is the teaching of writing if students are to reach the high standards expected of them today. He further stated that, “Writing is hard because it is a struggle of thought, feeling, and imagination to find expression clear enough for the task at hand” (p. 9).

Nagin (2003) also cited research by White, Barzun, and Gelbart that described the recursive nature of writing. They explained that writing is complex and involved planning, reflection, drafting, and revision not necessarily in a linear fashion. Each writing phase required problem solving and critical thinking (p.10). That is, the strength of writing is to make students think critically and problem solve. Also, writing is an active, visible expression of what students know and how well they have learned it.

One change brought about with research from the 1980s made some writing teachers lessen the emphasis of grammar in teaching writing. Studies suggested that knowing proper grammar had very little effect on writing. Noskin (2000) expressed that some basic knowledge of sentence construction taught to students would help them write better, but Baron (2003) related that teaching grammar did not lead to better writing. He found that college professors still ranked teaching grammar as the most important skill for students entering college while high school teachers considered it least important. The ACT listed this disparity as a major reason why almost 20 % of beginning college students had to take a remedial writing course. Baron feared that more emphasis on SAT and ACT writing tests would become more of a test of standard written English. He stated that ACT's conclusions concerning grammar in high school were wrong, and that grammar was important to high school teachers. Shuman (1991) agreed when he stated, "While some studies connect grammar instruction and writing, many more suggest that the ability to write well has little to do with how much grammar a person knows" (p. 82). Nevertheless, 69 % of the high school teachers surveyed by the ACT claimed they taught grammar and 90 % taught sentence structure. Cavanagh (2003) found on the National Curriculum Survey that college English professors considered correct grammar and usage more essential than high school teachers. Perhaps this is one reason so many high school students need further instruction in writing when they get to college. ACT officials stressed the need for correct grammar and usage on their college-entrance exams. Whole language teachers embraced the process model of teaching writing, coaching, and modeling students to express themselves by developing skills in the writing process.

Hillcocks (1986) took data from 73 statistical studies to compare the effects of various modes and focuses of instruction. He discovered several important ideas on teaching writing.

First, he found that when an emphasis on the grammar and mechanics of writing was taught, writing actually got worse than that of students who were not taught strict grammar and mechanics. Second, he found that marking every error on papers was no more effective in raising writing achievement than marking no errors at all.

Research has found that very young children wrote before they read. Writing came easier to them than reading, because writing was more directly related to their speaking. That is, students found writing more active than reading that was more passive, unless reading was aloud. Writing was particularly effective with adolescents as a powerful tool by which they could reflect, and “find themselves.” The implications for teaching were for teachers to start students writing, and then reading what they wrote. This technique involved active learning not passive. As restated by Elbow (2004), “Writing can help students at the college level as well, by providing them with a meta-cognitive understanding of the nature of the reading process” (p. 12).

Anderson (2006) believed in helping writers find power when he suggested:

By valuing students’ deeper messages and helping them learn from their errors, we can repair writing attitude breakdown. Struggling writers often believe they have nothing of value to say. So first I have to change that belief and allay their fears. (p. 70)

Denti and Guerin (2004) acknowledged that secondary schools have an elephant in their midst. The elephant represented a large number of students with very poor literacy skills. To remove the elephant, Denti and Guerin suggested direct instruction and cognitive comprehension strategies. Most poor reading students needed in-class learning strategies and accommodations to improve their skills in content areas. Finally, positive attitudes and behaviors must support achievement.

Whiteman (2001) concluded that writing was learned:

First, more information about composing processes will enable us to help students when they get “bogged down” in those processes; perhaps we will be able consciously to introduce students to composing processes with which they are unfamiliar. Second, the abundance of developmental information that will result from these and similar studies will give us baseline data on the natural course of writing development. ... Third, information about the real uses of writing outside of school will do a number of things... All such information on the real uses of writing in our society will enable us to enhance greatly the teaching of writing: we can tailor instruction to fit the needs and motivations of our students. Fourth, information about the effect of language variation on learning to write will enable us to teach language to minority students more effectively. (p. 155)

Harris, Graham, Mason, and Saddler (2002) introduced Self-Regulated Strategy Development (SRSD) that focused on the development of composition and self-regulation strategies to improve writing. This project was met with some success but more research needs to take place.

Sublett (1993) introduced using a model essay as one way to improve students’ writing. He prepared a model essay and used it as an example of how to write an essay. When he corrected the essays, he usually referred students back to the model essay to assist them in correcting their mistakes. He found this to be an effective method to improve essay writing with students.

One popular writing method with teachers is the writers’ workshop promoted by Zemelman, Daniels, and Hyde (1998) that identified best practices for teaching writing. They stated that the writers’ workshop helped improve students’ writing in the following ways:

Increase student ownership and responsibility by:

- helping students choose their own topics and goals
- using brief teacher-student conferences
- teaching students to review their own progress

Increase class time spent on writing whole, original pieces through:

- establishing real purposes for writing and students' involvement in the task
- instruction in, and support for, all stages of writing process
- pre-writing, drafting, revising and editing

Increase teachers' modeling writing-drafting, revision, sharing-as a fellow author, and as demonstrator of processes

Increase the learning of grammar and mechanics in context, at the editing stage, and as items are needed

Increase writing for a real audience; publishing for the class and outside communities

Increase the use of the classroom as a supportive setting for shared learning through:

- active exchange and valuing of students' ideas
- collaborative small group work
- conferences and peer critiquing that give responsibility for improvement to authors

Increase writing across the curriculum as a tool for learning

Increase constructive and efficient evaluation that involves:

- brief informal responses as students work
- through grading of just a few student-selected, polished pieces
- focus on a few errors at a time
- cumulative view of growth and self-evaluation
- encouragement of risk-taking and honest expression. (p. 159)

The authors of the National Writing Project (2004) stated that, "Teaching students to write well is one of the most challenging tasks in education. Writing itself is complex, often disorderly, and frequently frustrating. When teachers compare notes and approaches, they invariably conclude that they need more than a fixed or single approach to teach writing, particularly if they are to address the needs of all students". They produced a book that listed 30 ideas for teaching writing. The following were the 30 ideas developed by 32 writing project teachers to address better student writers:

- Use the shared events of students' lives to inspire writing.
- Establish an email dialogue between students from different schools who are reading the same book.
- Use writing to improve relations among students.
- Help student writers draw rich chunks of writing from endless sprawl.
- Work with words relevant to students' lives to help them build vocabulary.
- Help students analyze text by asking them to imagine dialogue between authors.
- Spotlight language and use group brainstorming to help students create poetry.
- Ask students to reflect on and write about their writing.
- Ease into writing workshops by presenting yourself as a model.
- Get students to focus on their writing by holding off on grading.
- Use casual talk about students' lives to generate writing.
- Give students a chance to write to an audience for real purpose.
- Practice and play with revision techniques.
- Pair students with adult reading/writing buddies.
- Teach "tension" to move students beyond fluency.
- Encourage descriptive writing by focusing on the sounds of words.
- Require written response to peers' writing.
- Make writing reflection tangible.
- Make grammar instruction dynamic.
- Ask students to experiment with sentence length.
- Help students ask questions about their writing.
- Challenge students to find active verbs.
- Require students to make a persuasive written argument in support of a final grade.
- Ground writing in social issues important to students.
- Encourage the "framing device" as an aid to cohesion in writing.
- Use real world examples to reinforce writing conventions.
- Think like a football coach.
- Allow classroom writing to take a page from yearbook writing.
- Use home language on the road to Standard English.
- Introduce a multi-genre writing in the context of community service.

(pp. 1-30)

Because Writing Matters written by Nagin (2003) described the status of writing today and highlighted effective classroom practices and successful school writing programs. This book was established by the National Writing Project as a resource for school administrators, educators, and policymakers wanting to improve student writing at all grade levels. Since 1974 with twenty-five teachers at the University of California until today when it comprises 175 NWP

sites in fifty states, the National Writing Project has made its mission to improve the quality of writing and learning in our nation's schools. The purpose of the National Writing Project (2003) is threefold:

1. To make the case that writing is a complex activity; more than just a skill or talent, it is a means of inquiry and expression for learning in all grades and disciplines.
2. To examine current trends, best practices, research, and issues in the teaching of writing, such as its role in early literacy; how the process of the writer in the real world can be developed in the classroom; how writing can be fairly and authentically assessed; and how writing can be taught across the curriculum.
3. To offer practical solutions and models for school administrators and policymakers involved in planning, implementing, and assessing a writing program as well as those seeking effective staff development for teaching writing. (p. 3)

instill effective writing, Fox (1998) wrote that one must invite dialogue into the classroom. She cited the works of cognitive psychologists, Bruner, Piaget, and Vygotsky, who formed a model of cognitive growth that was based on the dialogue between learner and teacher. She brought that dialogue to the classroom to teach writing.

Grossen (2004) introduced a specific model of instruction designed at the secondary level school with high-risk students. This model called the Direct Instruction (DI) model had its goal to close the achievement gaps of at risk students. DI accelerated learning by providing a highly structured curriculum with total task behavior. DI was based on good teaching research as an instructional tool. Every four weeks, test results were summarized and reported. The DI program has over thirty years of data improving literacy with older students. Research concerning students with reading and academic difficulties (Denti & Guerin, 2004) favored approaches that used direct instruction and cognitive strategy instruction. They also explained that an analysis of 180 studies revealed nine effective instructional components to confronting poor literacy:

1. sequencing tasks, prompts, and activities
2. drill-repetition and practice-review
3. segmenting into small units and then synthesizing
4. direct questioning and responding
5. controlling the difficulty of materials
6. use of technology-media
7. small group instruction
8. supplement to teachers' instruction
9. strategy cues (p. 117)

Now, more and more educators understand that writing is central to academic success.

Because Writing Matters (Nagin, 2003) emphatically stated, “Students need to write more across all content areas and that schools need to expand their writing curricula to involve students in a range of writing tasks ” (p. 6). Nagain stated that the challenge has been echoed at the national level by the National Assessment of Educational Progress (NAEP), the National Council of Teachers of English (NCTE), the American Association of School Administrators (AASA), and the National Academy of Education’s Commission on Reading.

As stated by Elbow (2000) in *Everyone Can Write*:

- It is possible for anyone to produce a lot of writing with pleasure and satisfaction and without too much struggle.
- It is possible for anyone to figure out what he or she really means and finally get it clear on paper.
- It is possible for anyone to write things that others will want to read.
- Teachers can empower students, help them to like to write, and be more forceful and articulate in using writing in their lives. (p. 11)

Major Writing to Win Strategies

Journal Writing

Dart, Boulton-Lewis, Brownlee, and McCrindle (1998) stated in their paper focused on the change in knowledge of learning and teaching through journal writing, that there was a change in student understanding when students used journal writing to express their ideas. In a one-year study of education students using learning journals, Dart, Boulton-Lewis, Brownlee,

and McCrindle (1998) found that students tended not to relate theory and practice until they reflected on how they became connected in their journal entries. That is, students reflected and developed meta-cognitive thinking by using student journals.

When looking at journal writing in the area of social studies, Kashatus (2003) suggested that the best way for history students to learn history in a meaningful way was to simulate events of the past. This method, although time consuming, led to the most rewarding and memorable history lessons. He encouraged the students to work with documents, artifacts, photographs, oral histories, and family genealogies, visits to historic sites, special collections, and public and private libraries. He stressed the importance between primary and secondary sources and writing attention and reflection. Kasatus (2003) emphasized:

Providing students with opportunities that will allow them to relate to the people and events of the past and then reflecting on the experience through journal writing can be a powerful way to teach both historical understanding and empathy with the human element of the past. (p. 40)

Researchers Urquhart & McIver (2005) noted that journal writing alone was not likely to improve student writing. However, their research suggested that journal writing, when guided by the teacher, and when its purpose and performance expectations were clear, was more likely to lead to good writing skills.

How did teachers grade journal writing? When journals were collected and used as a resource for writing topics, the value of the journal was reinforced and not viewed as busy work. Journals were viewed as a place for students to write without fear therefore, the content of journals should not be graded. Positive, encouraging remarks needed to be written by the teacher to encourage further journal writing (Zinn, 1998).

Urquhart and McIver (2005) identified journal writing as a widely used writing-to-learn assessment that should be applied to any content area. They mentioned the example of the KWL

strategy where students wrote what they know about the topic, what they want to know, and what they had learned as an excellent example of journal writing. Journal writing could be adapted to any subject area.

Wanket (2005) stated that:

Journal writing is strength training for the mind. Writing needs to be done daily, just like exercise; just as muscles grow stronger with exercise, writing skills grow quickly with writing practice. I often see a rise in student confidence and performance after only a few weeks of journal writing. Journal writing connects students with their emotional selves and core values. Through writing, students become aware of the relevance of their belief systems. Through writing, they begin a healthy habit of reflecting on moral values as they consider problems and issues that come up in their studies and in their daily lives. (p. 74)

After guiding students through daily journal writing for 15 years, Wanket (2005) recognized five main benefits of teaching writing with journals:

- Journals provide an opportunity for reflection. Students can relate what they are learning to their own world.
- Journal writing improves essays. Students gain fluency by writing daily.
- Journals can reveal trouble. Often student problems are revealed.
- Journals help students and teachers bond. Teachers gain insight into students' lives.
- Daily journal writing is an excellent way to begin class. (p. 75)

Furthermore, Wanket (2005) listed seven ground rules for working with journal writing:

- Date every entry.
- Don't waste paper. She likes students to use all sides of the paper and it makes the journals easier to read.
- Write in pen—any color, as long as it's legible. This is fun for the students.
- Write without ceasing. Don't stop to edit spelling or other mechanics.
- Journal notebooks are only for journal entries. Other work does not need to be put into the journal notebook.
- Journals are private. Students do not need to share their journals unless they choose to.
- Then again, journals are not private. For example, if someone is hurting himself or others, the proper authorities will be involved.
- Journals are graded. Grade only for content. (p. 75)

Process Writing

Writing was taught throughout the curriculum. Researchers agreed on the most effective approach to writing instruction - process writing. Process writing utilized steps that accomplished writers engaged as they wrote and rewrote. This research by Unger and Fleischman translated into instructional guidelines for the five stages of the writing process:

- (1) engaging in prewriting tasks;
- (2) creating an initial draft;
- (3) revising the text;
- (4) editing for conventions; and
- (5) publishing or presenting a polished final draft. (p. 90)

Process writing has become an established practice during the last 20 years. In a 1992 survey by the National Assessment of Educational Progress (NAEP, 2002), students were asked how much emphasis their teachers placed on process writing. The NAEP survey found that students who reported greater use of process writing had higher average writing scores (National Center for Education Statistics, 1996). Alarming, Denti found that the National Center for Educational Statistics (NCES, 1996) indicated also that more than 66% of eighth grade students and over 50% of students in grade 12 are below the proficiency level in reading (p. 109).

The writing techniques associated with higher scores on the 1992 NAEP test included:

- Planning the writing;
- Making a formal outline before drafting;
- Defining the purpose and audience;
- Using resources other than the textbook; and
- Writing more than one draft of a paper. (p. 91)

The results of the NAEP survey offered teachers reassurance that a process writing approach, defined by the five steps above, successfully improved writing results such as the NAEP's 25 minute essay. This was only cautious support of the process writing process. More

studies need to be administered before process writing is fully supported. Students might become good writers using other approaches. Unger and Fleischman (2004) stated:

By focusing attention on an area of instruction that often has been overlooked, the process writing approach has had a significant impact on U. S. education. Even if only tentatively supported by research, the principles of process writing provide guidance to teachers on potentially effective instructional practices. Future research focused on the contextual and social variables that influence how students acquire writing skills, combined with more rigorous evaluation of instructional approaches, will build the evidence base that educators need to teach the *write stuff*. (p. 91)

Noskin (2000) found that his high school students needed some structure in writing and found that the process approach of writing, prewriting, writing, and revising, was the way to teach his students. As he continued to teach, Noskin (2000) discovered that teaching writing as a process was more difficult than first imagined. He stated that prewriting asks a writer to create and organize thoughts. He found that talk was essential to prewriting and enough time needed to be built into the lesson for brainstorming. Brainstorming ideas were an important part of the *Writing to Win Program*, and when students wrote brief writing passages, more discussion needed to have taken place before writing. Noskin (2000) gave a final point to prewriting that it concerned the purpose and audience. Noskin further assessed that students needed to remember both purpose and audience when writing.

Slater and Horstman (2002) made a case for the process of reciprocal teaching. Promoting the use of cognitive strategies designed to help students organize the writing information, they explained that students who worked with reciprocal teaching increased their group participation, increased strategies taught, learned from the studied passages, and increased their learning when reading independently.

What is reciprocal teaching? Slater and Horstman (2000) listed four supporting strategies in reciprocal teaching:

1. Questioning. Questions about the readings were brought before the group to be answered.
2. Clarifying issues. If any problems arise from questions, members clarify them.
3. Summarizing. The leader or group members summarize what has been discussed.
4. Predicting. Members predict what will happen next in the text. (p. 165)

Peer Evaluation

What does research tell teachers about the effective use of peer evaluation?

Black (2004) has found that:

Peer assessment is uniquely valuable because students may accept criticisms of their work from one another that they would not take seriously if the remarks were offered by a teacher. Peer work is also valuable because the interchange will be in the language that students themselves naturally use and because students learn by taking the roles of teachers and examiners of others. (p. 14)

Saddler and Andrade (2004) explained that writing was improved by using rubrics to establish a system of ongoing feedback from peers. Peer assessment took place in many forms showing:

- (1) Students must understand that they are not assigning a grade to their fellow student's writing but rather providing feedback that can help that student improve the written piece; and
- (2) Teachers must model and teach to students a careful, constructive peer assessment process. (p. 51)

Saddler and Andrade (2004) gave two keys to successful peer assessment:

- (1) Teachers tell the students the difference between grading and feedback; and
- (2) Teachers teach students to use a rubric along with the constructive critique process. (p. 51)

Payne, B. K. and Monk-Turner (2005) found much success with peer evaluation in their studies, and even incorporated peer suggestions in their revisions, but students did not accept peer suggestions without careful thinking. They further stated that students recognized the

importance of peer review in improving their academic writing skills. Students gave reasons for the success by stating that they learned much by reading each other's writing and by giving each other advice; their peers had excellent suggestions; having a peer read one's writing was motivating, peer review made them understand the importance of having an audience, and peers made them aware of mistakes they wouldn't find themselves.

Prins, Sluijsmans, Kirschner, and Strybos (2005) explained that results showed that students in general had a positive attitude toward assessment by peers. They cautioned that rules needed to be provided in order for positive formative feedback to be given to students. Students needed more support on receiving, accepting, and coping with feedback.

Concerning self, peer, and tutor assessments, Stefani (1994) found students have a realistic perception of their own abilities and make rational judgments on the achievements of their peers.

Having dealt with Chinese English as a Secondary Language (ESL) student writers and the use of peer review, Hu (2005) stated, "Peer review has a prominent place in process-oriented writing instruction" (p. 321). He defined peer review as, "a collaborative activity involving students reading, critiquing and providing feedback on each other's writing, both to secure immediate textual improvement and to develop, over time, stronger writing competence via mutual scaffolding." (p. 322)

In a study on peer evaluation, Zinn (1998) promoted an informal evaluation dealing with collaborative efforts and meaningful group assessment and interaction. Peer assessment started with much structure but was reduced as students become more comfortable with each other. One of the disadvantages of peer evaluation was the process was time-consuming. Students were taught to give effective feedback and criticism with meaningful, evaluative comments.

Orsmond, and Stephan (1996) reported a study that evaluated a method of peer assessment as a formative and summative assessment procedure. Pairs of first-year undergraduate biology students were asked to complete a poster assignment on a specific aspect of nerve physiology. Peer assessment was utilized and although the peers involved liked peer input and felt that the benefits heightened their awareness, Orsmond's results questioned the validity of peer assessment because students marking against a tutor ranged from 31% to 62% agreement. He considered peer assessment not only a grading procedure, but as a teaching tool. Osmond (1996) found some disadvantages of peer assessment as an assessment technique. In a later study by Osmond, Merry, and Reiling (2000), a study involved methods of peer and self-assessment with an emphasis on student constructed marking criteria. The following results were noted:

- (a) Students may be less able to discriminate between individual marking criteria which they have constructed compared to marking criteria that have been provided;
- (b) Asking students to construct their own making criteria in discussion with tutors or fellow students does not enhance agreement between student/tutor or student/student marking; and (c) allowing students to construct their own marking criteria may lead to different learning outcomes compared to providing student with a marking criteria. (p. 23)

This study showed a range of agreement (30-70%) which was greater than that of the earlier study by Orsmond, Merry, and Reiling (1997). The range was comparable to that obtained in the previous study. Agreement between students' self-marking was not enhanced when the marking criteria were derived from students

Revision

Christiansen (1990) explained the importance of revision in writing composition by stating, "According to research, professional writers spend 25 percent of their time revising manuscripts, yet secondary school students devote less than 1 percent to editing and revision.

Students need to learn techniques for editing papers so that what they finally submit is not equivalent to a first draft” (p. 70). Revision allowed students to help students see their own strengths and weaknesses and to be self critical of their own writing. Christiansen (1990) also stated that students learned from evaluating their own work and critiquing their own writing.

Concerning revision, Noskin (2000) summarized that teachers needed to help students transition from creating to analyzing their work, or as he stated , to help students learn how to remove themselves from their own writing. Revising required a breaking down of the text. Noskin further made the important distinction that revising and editing are not the same .

Alsop (2001) in reviewing Amy Lee’s articles on composing critical pedagogies on teaching writing as revision focused on how Lee drew critical parallels among critical pedagogy, critical thinking, and the writing process. She further stated that:

She sees critical thought and *revisionist* pedagogy as perfectly suited for the writing classroom, which of course, centers on language and discourse. Since critical thought and self-analysis depend on language and communication with other, she argues, the writing class is a natural space for the enactment of critical, revisionist pedagogy. (p. 430)

Lee further argued that “revision” is the only reason worth teaching learning with students to see themselves, authority, meaning, and texts- as the on-going processes of construction, and writing (p. 430). Delyser (2003) related that, “Writing is a skill and a craft that can be learned and practiced. Revision is one of the most difficult topics to teach” (p. 176). He further stated:

By sharing their work with their peers, students learn to give constructive criticism, they may begin to overcome the fear of sharing their work with others, and they see the positive influence the comments of others can have on their work. (p. 179)

What do Urquhart and McIver (2005) explain about revision? They stated that:

Revision does not come naturally to students; they must be guided through the process. The examples you share can help them determine how to make the kinds of structural changes to their writing that result in the improvements you want to see your students make. (p. 19)

There is a difference between editing and revision. Hull and Bartholomae (1986) stated that:

When a writer revises, he can experiment with the sound of sentences, with his style, with the way his own person use of the language can vary from other uses. When a writer edits, he looks for mistakes, for those moments when his language breaks rules that may not be broken without consequence. (p. 48)

Writing Assessment

One of the concerns about national and state writing tests was that the conditions for the testing did not allow for adequate circumstances for demonstrating writing proficiency. One major concern (Schuster, 2004) was that the period of time the student had to write did not allow the student to revise and/or to redo the essay. The College Board's achievement test allowed 20 minutes to complete the test. The NAEP allowed 25 minutes that did not allow adequate time for prewriting. Forget the editing and proofreading process. Students were lucky to complete one rough draft in 20 to 25 minutes. Greeley (2003) expressed that good writing takes time and was concerned that, "When the motivation is to meet the criteria of a standardized test, instruction is often rigid and formulaic, hardly contributing to the conditions it takes to inspire real high-quality writing" (p. 10a).

Hansen (1996) stated that evaluation was the center of writing instruction and "explored three aspects of evaluation: to find value in the content of writing, to promote writing growth, and to rethink the role of teachers who value themselves as learners" (p. 188). She stated in light of two decades of research on writing that teachers must look towards the value in the content of student writing and the literature read. Next, she saw evaluation as going beyond the value in the

content and as a means to encourage growth. Hanson (1996) stated, “The teacher’s task is to help the child generate possible goals and choose one to work on” (p. 191). Evaluation encouraged students to continue to write. The last value of evaluation Hansen promoted was to rethink the role of the teacher. The teacher became more of a facilitator or promoter of writing with students.

Strickland, Bodino, Buchan, Jones, Nelson, and Rosen (2001) discussed teaching writing in this time of reform. Many writing teachers in this article expressed concern over teaching writing to meet the demands of high stake testing. Most teachers provided rubrics for the writing and found that students’ writing became more uniform and less interesting than in the past when rubrics were not used. In the advent of statewide testing curriculum reform, teachers were altering instruction prepare students for high-stakes statewide testing. Nedra (2001) discussed changing perspectives on writing instruction:

Only during the past 3 decades has unprecedented attention been given to what people do when they write and how their writing can best be supported in the classroom. This research has caused a significant shift away from studying the writing products of students to studying the processes associated with those products. (p. 387)

Strickland et al. (2001) explained that not only were teachers concerned about how best to teach writing; but also, they were aware of the public pressures for students to perform well on statewide tests. Writing curriculum was developed based on the writing processes associated with effective writing. Strickland et al. (2001) further reflected that one of the greatest changes in teaching writing was giving more attention to written composition in the early grades. The National Writing Project of the 1970’s encouraged teachers to write, to reflect on their experiences, and to conduct the teaching of writing.

Strickland et. al. (2001) also stated that, “Most important, effective test-taking should be viewed as a by-product of good instruction, not the goal. As teachers and teacher educators, we

are convinced that ongoing, long-term professional development is the key to better writing instruction” (p. 396).

As stated by Baldwin (2004), “The emphasis on writing in the curriculum has been accompanied by the rapid growth of writing assessment” (p. 72). Today’s students wrote for tests from NCLB-mandated subject assessments from elementary school to the new College Board SAT, which featured a writing section beginning in March 2005. What constitutes an authentic assessment of student writing? States were examining this question carefully, although most assessments were linked to state standards and judged writing by specific elements. Many states followed the National Assessment of Educational Progress model that dealt with writing genres – narrative, expository, and persuasive. In today’s technological world, educators need to use writing to stimulate higher-order thinking skills (p. 73).

In his article on standardized writing assessment, Baldwin (2004) provided an overview of writing assessment and explained how technology was changing assessment. Baldwin also explained how educators could improve their students’ writing skills by applying assessment practices in the classroom.

Rubrics can assess writing and learning. As stated by Urquhart and McIver (2005),

Rubrics are very effective assessment tools because they describe specific levels of performance. Research supports using rubrics because they clearly communicate expectations for both teaching and learning. Researchers, Schunk and Swartz (1993), conclude that explaining to students why a strategy is useful helps them buy into it and become motivated to use it. (p. 31)

Mabry (1999) proposed that the assessment of student writing achievement should be judged on the basis of student writing instead of multiple-choice items. That is, she found that direct writing assessment was the best indicator of students’ writing achievement. Rubrics, or scoring guides, to score performance were critical to implementing academic standards.

Assessments in writing needed to be designed with the end in mind. Urquhart and McIver (2005) listed the following steps in designing writing assessments:

- Collaboratively study the demands of the standardized tests your students will take.
- Identify the skills and knowledge required to do well on those tests.
- Discuss ways to integrate those skills into your curriculum. (p. 29)

Stating the elements of effective design, Urquhart and McIver (2005) stated further that students should analyze, apply knowledge, and integrate ideas. Writing assessments lend themselves well to measuring writing skills. The authors of *Teachers Writing in the Content Areas* (2005), stated that to create a good assessment, according to the National Writing Project (2003), the teacher should be familiar with the four traits that reflect sound teaching and reliable research. The four traits were:

Clarity. All parties understand what is being assessed.

Variety. Teachers use multiple samples for assessment.

Sound pedagogy. Assessments reflect instruction based on knowledge of how students learn and on professional experience.

Reliable research. Classroom assessment techniques are supported by a body of scientifically based research. Thirty years' worth of empirical research suggests that students learn better when they write over extended periods and have opportunities to reflect on their own writing. (pp. 29-30)

Evaluation was the most difficult and tedious part of a writing teacher's job reflected by Zinn (1998).

Writing evaluation included formal and informal measures of grading. Informal assessments were instructor responses, self-assessment, peer evaluation, and writing conferences. Formal evaluation measures were described as multiple-choice tests, impromptu timed essays, and portfolios. Zinn (1998) defined writing as a "skill with teachable parts which produces a measurable product" (p. 29). According to Zinn (1998), the International Reading Association

and the National Classroom Teachers of English (IRA & NCTE Joint Task Force, 1994)

summarized the following:

(1) The assessment measure used should encourage students to think about their own writing in productive ways, such as evaluating their own growth and setting goals for improvement. The teacher comments should motivate students to want to revise.

(2) Feedback given to student writers should be stated in terms of what they can do, not in terms of what they failed to do. Teachers should show students not only what is wrong but how to improve the writing.

(3) Any assessments should yield high quality results. (p. 30)

Camp (1998) described the use of portfolios as another means of assessing writing by stating:

Thanks to the explorations of portfolios and reflection now occurring in schools and classrooms across the country, we are also becoming more accomplished at bringing students into dialogue about their writing. Through the give and take of that dialogue, I believe we will all be enriched. (p. 13)

Underwood (1998) described another study on portfolios at the middle school level that supported the judgment that average students who were instructed in the art of reflective analysis by using systematic reflective questions and reflective events became more aware of the more sophisticated complexities of writing.

Strong, Davis, and Hawks (2002) explained self-grading as it applied to writing. They stated that when comparing students who graded themselves against teacher grading, students were more motivated to learn when grading themselves and took more responsibility for their learning. One disadvantage was grade inflation occurred when students graded themselves.

Mattenson (2004) downplays grades in his classes and lets students evaluate themselves against set standards. Therefore, his students become more accountable for their writing.

Orsmond et al. (2000) listed these conclusions about peer evaluation:

Students may be less able to discriminate between making criteria that they have constructed themselves compared to making criteria that are imposed on them. During the construction of the marking criteria, students may form integrated 'mind maps' of the marking criteria and do not see the marking criteria in discrete terms as they may when given criteria.

- (1) Asking students to construct their own marking criteria in discussion with their tutor and fellow students does not enhance agreement of student/tutor or student/student marking. However, such agreement should not be seen as a measure of the success of peer and self-assessment exercises.
- (2) In the same exercise, allowing students to construct their own marking criteria may lead to different learning outcomes compared to providing students with marking criteria.
- (3) In this study and in the previous peer and self-assessment studies the response from the students to the activities they carried out was very positive. A factor that should be paramount to all activities related to assessment is discussion between tutor/student and student/student.
- (4) Students need guidance in distinguishing between the processes, constructing marking criteria, and the marking of that criteria. Students need to be clear in their mind that there is a difference. (p. 36)

According to Black (2004), improved formative assessment raises student achievement.

In her 1998 article she addressed three problems:

- (1) The assessment methods that teachers used were not effective in promoting good learning;
- (2) Grading practices tend to emphasize competition rather than personal improvement; and
- (3) Assessment feedback often has negative impact particularly on low achieving students, who are led to believe that they lack the ability to learn. (p. 9)

She suggested that teachers needed to conduct classroom dialogue emphasizing longer *wait-time* before answering questions. Black (2004) stated, "Increasing *wait-time* can help more students become involved in discussions and increase the length of their replies" (p. 12).

Thomas (2004) cautioned against the use of high-stakes testing dictating the writing curriculum of the school. He stated:

The impending changes to the SAT and proclamations regarding the 2002 NAEP writing test results reveal another significant fact: that the decisions made in design, implementation, and scoring of standardized commercial tests indirectly dictate curriculum, instruction, and assessment in our schools. (p. 76)

Standardized commercial tests provided narrow data on student achievement and distorted data on educational quality. These tests dictated teacher practices at the expense of effective practice supported by decades of research (Hillock, 2003; Mabry, 1999, Thomas, 2004). Solid evidence was offered by Hillocks (2003) and Mabry (1999) that high-stakes testing was harmful to writing instruction and student achievement. Using these tests as guides, teachers composed classroom assessment to reflect high-stakes test questions limiting time for students to compose in an authentic manner.

Teachers' Roles

What was the teacher's role in developing writers? Rickards and Hawes (2004) stated that, "Effective writing teachers are models, coaches, assessors, planners, and consultants" (p. 70). Remembering that there were many aspects to an exemplary writing program, teachers charged with teaching writing to diverse populations, assumed many roles depending on the students' needs. Some roles identified by Rickards and Hawes (2004) were as follows:

- *Teachers as Models:*

Students gain valuable insights into the writing process by following the lead of their teachers as they select a topic, plan, wrote, revise, and edit a writing piece. Often teachers target a skill they want students to learn. Teachers also focused on good writing by exposing students to well- written children's literature.

- *Teachers as Coaches:*

Writing teachers are coaches when they address common goals and activities, build social bonds, and support students as they grow as writers.

- *Teachers as Assessors*

Teachers examine student writing to determine strengths and weaknesses. There are two main reasons for assessment. First, the teachers assess writing report to other people such as the public, parents, and administration. Second- and most important- to assess students' writing to guide instruction. Rubrics offer teachers a way of assessing writing while also allowing students a guideline for writing expectations. Rickards et al. (1999) discussed rubrics, adding many benefits to assessing writing. Rubrics:

- Require the teacher to think through and identify the main target skills to assess.
- Make the teacher's expectations and assessment criteria clear to the students.
- Easily translate into a tool for self-assessment.
- Foster collaboration among teachers who work together to develop rubrics.
- Can assist students' understanding of the elements of good writing if students help develop the rubric.

- *Teachers as Planners:*

Planning is crucial to effective teaching. Writing lesson plans need to be based on student needs as determined by assessments to allow for students who perform at different skill levels. Daily, unit, and yearly plans need to be written so that all the required objectives are addressed. The sharing of the writing needs to be part of the plan for exemplary writing.

- *Teachers as Consultants:*

Writing teachers need to consult with large and small groups as well as individuals concerning the writing process. These roving conferences allow the teacher to informally assess the progress of her students and make suggestions for improvement.

- *Combining the Roles:*

The five roles of the writing teacher are not separate roles. Most of the time, the teacher is serving in several roles at a time. Writing excellence takes time and patience along with skill and knowledge. The goal is to make each student an active, effective writer. (pp. 68-71)

Increasingly, educators, policymakers and others, view writing as one of the best ways to improve critical thinking and learning across the curriculum (Fisher, Frey, & Williams, 2002). He further stated that discussion helped students reflect on the content and share their thoughts with their teachers. Sperling (1996) explained that the teacher remains the central force in writing instruction by providing useful language experiences and facilitating the writing process. Secondary writing provided students a means to move from understanding alone to demonstrating understanding (Jacobs, 2002). More teacher discussion needs to take place for students to integrate strategies to support students' development of understanding.

There were two purposes of writing as a means of understanding in the secondary schools. Writing was a means to evaluate students' understanding of content or of the written form, and as a means to engage students in learning (Applebee, 1981 ; Jacobs, 2002). Writing was a meaning-making process, or as Jacobs (2002) called it, a writing -to-learn process which invested students to learning. His pedagogy concerned with writing-to-learn included many writing strategies mentioned along with the use of scales or rubrics.

Fisher et al. (2003) believed that students should spend more time focused on teacher expectations and instructional strategies and less time on the content. In implementing instructional strategies, he believed that teachers needed to use research-based strategies and implement them across the content areas.

Jacobs (2002) stated that the strategy most supported by research to improve composition was a process called inquiry. Jacobs defined this strategy below:

Inquiry treats writing as a problem-solving activity in which students come to understanding something that they want to say before they begin drafting. In an inquiry-based classroom, teachers guide students through the development of assertions and arguments about these assertions. They choose instructional strategies to help students 1) find and state specific, relevant details from personal

experience; 2) analyze and generalize about the text or pose assertions about it; and 3) test the validity of their generalizations, arguments, or assertions by predicting and countering potential opposing arguments. (p. 60)

Swartzendruber-Putnam (2000) stated that able writers think critically about their writing and were active in the learning process. The author stated that, “My goal is to teach them to think critically and communicate clearly about their writing gain understanding and become better writers” (p. 88). She further believed that reflection was only part of the puzzle of authentic writing. The other parts were writing for real audiences, giving students choices for topics, and having them actively involved in their own learning completed the puzzle. She stated:

I could have saved myself frustration and time had I known from the beginning that a necessary element in teaching students to be independent, critical thinkers and writer is to make sure they care about what they are writing. (p. 89)

Kixmiller related writing with purpose by, “The writing classroom should challenge students to think in new ways, conceive of audiences, and identify issues that matter to them. Authentic writing helps students cultivate their unique voices” (p. 33). Gunter (2004) stated, “I want my students to connect literature with their world, and I want them to relay that appreciation through the written word” (p. 8). Abbe (2003) stated that this was difficult when nearly 66 % of high school seniors do not write a three-page paper as often as once a month for their English teachers.

Luttrell (2001) expressed concern that students acknowledged a gap between formal school literacy and their everyday literacy practices. Thomas (2000) related that, “Teachers have to be patient and persistent allowing students numerous opportunities to write and exposing them to hundreds of models of effective writing” (p. 43).

According to Levine (2002), by writing, a kid learns to mesh multiple brain functions, and ultimately that’s something you need to do whatever you do to earn a living. That is, the act

of writing helps build and maintain the brain pathways that connect diverse functions, such as language memory and motor control. In other words, writing is a way for a kid to practice putting his thoughts together. Also, writing serves as a platform for systematic thinking and a means of problem solving, two more abilities needed in any career .

Writing Across the Curriculum

Much research deals with the aspect of writing across the curriculum. In the design of the *Writing to Win Program* at the high school level, social studies, language arts, math and science teachers presented the writing strategies to their students. In 2005-06, the administration decided that writing across the science and math curriculum would add further dimensions to the writing process and reinforce what the other teachers were teaching.

Writing across the curriculum in the area of science was shown to be effective when teachers taught students to write scientific ideas into reflective journals and read aloud scientific information from interesting sources (Topping & McManus, 2002). They also found many aspects of writing apply to writing in science. Science-related literature was shared orally with the science classes. Science teachers realized that not only were they to teach science, but they were to teach students to transfer their reading and writing skills into science. Science teachers realized that students were responsive when they introduced units and lessons by reading aloud from articles and books that dealt with scientific topics. Journal writing adapted well to science especially jotting science concepts and ideas.

Buehl in Chapter Six of *Literacy Across the Curriculum: Setting and Implementing Goals for Grades Six through 12 (2003)* explained that writing in science is organized around “cause and effect connections” and often answered the following questions:

- Why does this happen?
- What would be the result if we did this?
- Why did these features (or phenomena) develop? (p. 113)

Buehl cautioned us that science books contain a great amount of information and many students struggle to make connections to their personal lives. He stated that some people have compared learning science to learning another language because it is so factual and unfamiliar to students.

Hartman and Glasglow (2005) stated that teachers need to put students' science writing in a realistic content. Writing within the classroom, they stated, might be characterized by one or more of the following ways:

- Writing activities involve realistic assignments that link classroom learning to professional utility, involve an audience other than the instructor, and require frequent interaction among students and between students and instructor.
- Writing is emphasized as a multipurpose tool for communicating and for learning content and literature relevant to the discipline.
- Assignments involve collaborative research and writing, and often take the form of major research projects culminating in oral presentations. Scientists collaborate, construct, and modify scientific knowledge.
- Critical peer review is routine, as it is within the science and engineering disciplines. Peer assessment and evaluation provide both writer and reviewer with opportunities to make sense of science content and process. (p. 77)

There was a parallel between the process of scientific inquiry and literary skills. Both required knowledge in questioning and setting a purpose, analyzing and drawing conclusions, and communicating the results. Draper (2002) contended that literary activities engaged students and teachers in making meaning from the text. Johnson and Giorgis (2001) researched and found that integrating reading instruction in geography motivated students to read in geography such as in atlases, informational text, and fictional stories (Holloway).

In a study of 545 teachers in 55 schools in Maryland, Guthrie, Schafer, and Huang (2001), found that students who had integrated literacy instruction had more chances to read and the result was increased reading comprehension, problem-solving, skills in science, conceptual knowledge, and motivation to read.

Listed in the National Science Education Standards (National Research Council, 1996), the goals for school science that underlie the National Science Education Standards are to educate students to:

- experience the richness and excitement of knowing about and understanding the real world;
- use appropriate scientific processes and principles in making personal decisions;
- engage intelligently in public discourse and debate about matters of scientific and technological concern; and
- increase their economic productivity through the use of knowledge, understanding, and skills of the scientifically literate person in their careers. (p. 13)

These goals define a scientifically literate society in which students who have completed a curriculum should know, understand, and apply.

Friend (2000/2001) observed that in high school and college, students who learned to summarize did significantly better on identifying important concepts and constructing the thesis of the article.

In explaining the best way to teach history, Kashatus (2003) stated it was to research and write about it. He further asked students to consider six questions when analyzing a document: (1) what is the content ? ; (2) who is the author?; (3) when was it written?; (4) where was it written?; (5) why was it written?; and (6) why is the document important in the broader context of American history? By emphasizing the use of primary source documents to build critical thinking skills, providing students with research tools for writing, and by urging students to

answer six questions when analyzing a document, Kashatus led them to transfer from the concrete to the abstract. Kashatus (2003) recommended replacing the traditional term paper with a local history research project by which students can identify. He further stated:

Professional historians and educators concerned about the inadequacy, both in quality and quantity, of history taught at the secondary level have emphasized the need for more writing in the curriculum. Not only is writing essential to develop critical thinking skills, but it is also indispensable for developing the kind of knowledge and social responsibility required for constructive citizenship. Accordingly, a student's understanding of historical subject matter lies in his or her ability to explain cause-and-effect relationships, interpret the significance of past events, and clearly articulate a position and defend it. (p. 39)

Kashatus (2003) spoke about the motivating factor of teaching writing through United States history when he stated:

Encouraging students to do history should be the fundamental objective of every teacher, and there is no better way to do history than researching and writing it. (p. 39)

Writing across the curriculum had its beginnings in the work of James Britton, and others from the University of London's Schools Council Projects. This study took place in English schools in the 1960s and 70s (Britton, 1975). Growing from a social dimension, writing across the curriculum has grown to refer to all disciplines of learning.

Writing was not only a way of knowing how to write; but also, a way of improving in a particular subject (Carter, 1991). The teaching of writing was not just the English teacher's responsibility and content-area teachers joined with English teachers to improve writing instruction. Even mathematics teachers have realized the importance in having students express math processes in writing.

According to Palombo (2003):

Experts agree that effective professional learning focuses on student learning, is owned by teachers, is connected to daily practice, is structured to promote collaboration, and is supported to ensure sustainability. Teachers must actively

develop their own style of expertise and understanding by using a given program structure and adding their creative touches to its delivery. (p. 28)

Educational reform significantly changed how writing was taught. Rigorous standards were established at local, state, and national level as a response to the publication, *A Nation at Risk* (National Commission on Excellence in Education, 1983). Strickland (2001) stated that, “Because state and local standards are a relatively recent phenomenon, it is not surprising that there has been virtually no research on their effect on classroom instruction or student achievement” (p. 390).

Strickland (2001) brought attention to teaching reforms that have led to many positive outcomes such as more clearly defining writing expectations at each grade level and assessment as an integral part of writing performance. Standards were clearer, and all teachers worked together to reinforce writing expectations. Teachers were cautioned to not be rigid with standards that inhibit creative writing.

Carter (1991) discussed in his article that the social studies teacher as a writing coach was the major theme in writing across the curriculum. Carter stated, “Writing is knowing-a-way not only to improve writing but also to help students improve in a particular subject” (p. 346). Odell has suggested that if writing was to be improved, the teacher must relate writing to his given subject. Even though many teachers have begun to view writing across the curriculum, many teachers still view the English teachers as the main writing teacher. One of the major complaints was that there was not enough time to teach writing within the subject.

Writing across the curriculum differed from subject, classroom, and student knowledge (Bazerman, 1991). Jacobs (2002) explained that writing across the curriculum was not readily accepted by secondary, content area science, history, and mathematics teachers. In order for these teachers to fully implement writing and reading across the curriculum, they must see that

reading and writing were meaning-making processes that can support their instructional goals especially those related to better understanding of the content.

Burns (2004) supports writing in the area of mathematics. She stated, “Writing in math class supports learning because it requires students to organize, clarify, and reflect on their ideas” (p. 31).

Burns (2004) further stated:

But the results I experienced with students were what clinched my commitment to making writing a regular part of math instruction. Not only did I see how writing helped students think more deeply and clearly about mathematics, but I also discovered that students’ writing was an invaluable tool to help me assess their learning. (p.31)

Burns used writing in math to have students organize, clarify, and reflect on mathematic processes. Writing in math classes differed from that in English or social studies classes because writing was used to provide a way for students to extend and refine their ideas about the math they were studying. The writing assignments given to students in her math classes were “keeping journals or logs, solving math problems, explaining mathematical ideas, and writing about learning processes” (p. 31).

Also, Burns (2004) discussed strategies for incorporating writing into math classes:

- Establish the purpose for writing in math class
- Establish yourself as the audience
- Ask students to include details and to explain their thinking as thoroughly as possible
- Have students discuss their ideas before writing
- Post useful mathematics vocabulary
- Write a prompt on the board to set students started on a writing assignment.
- Give individual assistance as needed
- Have student share their writing in pairs or small groups
- Use students’ writing in subsequent instruction
- Use student papers to create class inventories
- Keep each student’s work in an individual folder (pp. 32-33)

At the middle school level according to Yell (2002), teachers integrated writing strategies across the curriculum not only to enhance their understanding of content but also to improve everyday writing skills. Yell advocated the use of student notebooks to record meaningful sentences from a lesson. Select or key words were shared between teacher and student or between several students to capture the main ideas of a lesson and display them in front of the whole class. Another strategy that Yell found effective was the *Question All Write Strategy*, where teachers interrupted the class to pose a relevant question for students to discuss. This strategy enabled all students to write simultaneously and allowed for *wait time* for students to reflect their ideas. Mentioned also was the *Outcome Sentence Strategy* in which students responded in writing to teacher prompts during a lesson or other such experience. For example, “I wonder why?” would be an excellent prompt in which students would reflect and discuss. A third strategy, mentioned by Yell (2002), was called *Frames* that were composed of skeletal paragraphs that contained “information, important ideas, and transition words from the lesson that guide students into thinking and developing well-formed paragraphs” (p. 64). This strategy was especially useful when used at the end of an activity. The use of writing frames allowed students to excellently pull together information from a lesson and practice writing good paragraphs (p. 64).

As a summarizing statement, (Yell, 2002) concluded, “Writing should involve discovering, analyzing, synthesizing, and evaluating-not just copying or downloading” (p. 66). Yell’s (2002) important statement concerning adolescent writers was: when teachers embedded writing strategies into instruction, they enrich and enliven the required curriculum. They help students turn their notebooks into writing portfolios. Most important, they check for

understanding and enhance learning while helping students improve their writing skills, so that students can simultaneously become better thinkers and better writers.

Enders (2001) challenged high school teachers to communicate with teachers of freshman college students to better prepare future students to write successfully in college. This collaboration decreased the number of students who needed remediation at the college level. He further stated that, “If high school and college instructors are to collaborate successfully, they will need to listen to what their students have to say about what does and does not prepare them to write well in college” (p. 67).

To become better writers, Bolarsky (1981) emphasized:

To increase fluency, educators recommend meaningful daily writing experiences, such as journal writing, free writing, and the kinds of structured writing required in programs like those described. ... Many adults have difficulty writing because they are inhibited by fear of making mistakes. It is important to permit children to say what they want and then later help them make corrections without punishment for making errors. (p. 464)

Knutson (2000) suggested using *writing to think* activities that she found taught literature to second or foreign language students. Some of these activities highlighted by Knutson were:

List writing (a form of brainstorming on paper), focused free-writes (students write for several minutes without pausing produce a paragraph or two of text), writing pauses (students respond in writing to a question), written conversational chains (students write short responses to a text and pass it along to the next student who responds), note-taking (notes on specific narrative structure to share), and many others. (pp. 515-519)

As she further stated, “Writing can improve the quality and pace of classroom discussion by providing time to think” (p. 520).

Fleming (2003) explained that writing has been “reduced to a more-or-less uniform sequence of stages, thinking, writing, revision); the way it has been modeled on a single kind of text, the school essay; and the way it has been conceived as the outcome of a general skill that

transcends both content and context and is capable of being learned in a short period of time by young people in formal educational settings” (p. 105). He further stated, “There appears to be little interest, however, in returning to a product-based pedagogy that attends mainly to grammar and form” (p. 105).

Writing with Special Needs Students

With students having writing disabilities, the fact that writing is a complex task adds to the difficulty of learning to write. Christensen (1989) and Stein, and Dixon (1994) explained that low performing students found writing more challenging. According to Harris, Graham, Mason, and Saddler (2002), students with learning disabilities produced writing that was shorter, less cohesive, and poorer in overall quality. Often these students also have a more negative attitude toward writing. They proposed using self-regulated strategy development that included integrated research focused on cognitive development and learning behavior, and the role of affect in learning and development.

One strategy tried with special students to improve their narrative story writing was the use of a pre-structured story web. Zipprich (1995) found improvement in the areas of planning time and quality scores but did not in other areas. More work on story webs needs to take place in light of the success of graphic organizers. Graves, Valles, and Rueda (2000) addressed writing instruction in bilingual special education setting and the compositions of students with learning disabilities. All strategies tried, interactive journal writing; Writer’s Workshop; OLE; and a combination of journal writing, brainstorming and planning, and spelling practice yielded higher quality writing after ten weeks, but after one year, only the students who received Optimal Learning Environment (OLE) still demonstrated significant improvement in writing composition.

The OLE program “included an integration of oral language, listening, speaking, reading, and writing” (p. 1).

Gersten and Baker (2001) did a meta-analysis on writing interventions for students with learning disabilities and their findings suggested three components to be the most effective:

- (1) Explicit teaching of the writing process; and
- (2) Critical dimensions of different writing genres should be provided; as well as
- (3) Feedback to students on the quality of their writing for either teachers or peers. (p. 251)

From this meta-analysis, the authors summarized:

The three components-explicit teaching of critical steps in the writing process; adherence to a basic framework of planning, writing, and revision, and the provision of feedback – have reliably and consistently led to improved outcomes in teaching expressive writing to students with learning disabilities. (p. 267)

Special education students are now required to pass the GHSGT just as regular education students graduate. The authors, Barry and Moore (2004), developed a self-directed organizational strategy (SLD) designed to help special needs students pass a state competency exam. Along with SLD, a statewide rubric was used to measure student performance. The authors found that:

The class average for students with SLD who received strategy instruction and practice was equal to the average achieved in the general education population of the state in the same year and was not significantly different from the general education peers in the same school for that year. (p. 10)

Because writing was a fundamental means for students to communicate their knowledge in other content areas, it was a crucial skill for success in school. One problem faced by all writers especially those with problems were that relatively little time was allocated to practice and learn writing (Graves, 1983).

Stein (2004) made these recommendations for effective writing instruction among diverse learners as well as normally achieving students:

- Big Ideas – Focus on the most important ideas of writing such as text structures, the processes of writing, and writer/reader relationships.
- Explicit Strategies – Diverse learners benefit from explicit strategies across content areas.
- Scaffolding – Diverse learners need more scaffolding than normal achievement students.
- Review – Students should spend substantial time applying their emerging knowledge to a given text. (p. 11)

Troia (2002) suggested that strategies played an important role in helping student with and without disabilities manage the complex process of writing. He further stated that a majority of students were not able to organize and write. The goal was to increase the length of writing sentences and to organize the information and the quality of the product. Poor writers spend very little time revising and focusing on the mechanics of the text. According to Abbe (2003), nearly 66 % of high school seniors had not written a three-page paper even once a month or more for their English teachers and 75 % of seniors were not given a writing assignment in history or social studies.

An innovative writing program combining basal texts and instructional strategies was used by Gleason and Isacson (2001) to assist students with writing difficulties. They summarized research with special students by using checklists to examine two fifth grade classes success with the program. The results were that neither basal provided the level of explicitness needed for the students to effectively engage in the writing process. Using basals was a good start, but they recommended modifications such as modeling and providing specific procedural steps to provide students with scaffolds to writing. They found what that, “Before beginning the writing process, students engaged in background building and accessing prior knowledge” (p. 5).

Espin et al. (1999) gave three measures for predicting students’ writing proficiency:

The number of characters per word, the number of sentences written, and the mean length of correct word sequences. (p. 5)

As emphasized by Day (2002),

Motivation to learn is crucial for at-risk students who can be discouraged by constant lower-level drills and practice sessions that seem to focus on their shortcomings and repeated failures. (p. 22)

Casas (2004) promoted using interdisciplinary thematic units to expose students to writing in many disciplines and in organized units. She stated that, requiring them to write a thematic unit is one of the best ways for pre-service teachers to learn about authentic learning. Having them design discussion questions reflecting the six learning levels of Blooms Taxonomy into their lesson plans, for example, helps them understand how teachers can expose children to critical thinking.

Concerning writing instruction in bilingual special education settings, Pardes and Rich (1996) collected data from four case studies over a ten-week period. After a year follow-up, they found that teachers chose different approaches for teaching writing including: (a) interactive journals; (b) Optimal Learning Environment (OLE); (c) Writers Workshop; and (d) a combination of journal writing, brainstorming- planning, and spelling practice. All four types of writing showed improvement after 10 weeks. However, after one year later, only OLE elements demonstrated significant improvement in writing composition, the other approaches were more effective for short-term memory learning.

Graham, and Harris (1994) discussed the implications of constructivism for teaching writing to students with special needs. Whole language and process approaches to writing instruction were examined on the principles of constructivism. The benefits of whole language and process writing were frequent and meaningful writing, self-regulated learning.

In working with middle school students who had learning problems, De La Paz (2001) taught the students a strategy for planning and writing expository essays. The strategy for

composition helped students consider topics in advance and use text structure knowledge to develop five paragraph essays. Both regular and special teachers provided instruction. Four weeks after the instruction, students' writing and overall performance improved when student papers were examined. Even though the students' writing became more advanced, the students would have benefited by learning additional writing strategies.

Stillman, Jimerson, and Wilkinson (2002) discussed that there was little research on the development of writing of students with learning disabilities. As Stillman et al. (2002) stated, "Like reading and spelling, writing results from complex interactions among the linguistic and discourse systems and changes over time from an oral style of communication to a more literate style" (p. 45). Another topic of interest by Stillman et al. was listed as four reasons that speech-language pathologists (SLPs) should participate fully in writing development of students. First, because of their knowledge in the area of phonological awareness. Second, because most schools teach writing as a process, SLPs would benefit with writing process strategies. A third reason SLPs should be more involved in writing concerns is because of the growing impact of state and federal testing on the teaching of writing. The fourth and final reason for SLPs to increase their involvement with writing is that they can motivate students who manifest writing problems.

In light of an increase of students who do not speak English and the requirement of No Child Left Behind, secondary school educators are addressing the significant achievement gaps of state and national assessment.

Many secondary educators are alarmed at how far behind the English language learners (ELLs) are behind academically and in English proficiency. Echevarria (2006) stated that there exists a shortage of qualified ELL teachers adding to the dilemma faced by ELL students today. She stated that:

Although NCLB calls for highly qualified teachers in every core academic classroom by 2006, the supply of certified English as a second language (ESL) and bilingual teachers was too small to meet the demand. Less than 13% of teachers in the United States have received professional development to prepare them for teaching linguistically and culturally diverse students (National Center for Education Statistics, 2002). (p.17)

Often less prepared, less-qualified teachers were utilized to teach these students. These teachers were not prepared to address ELs' academic and second language success. Echavarría (2006) explained that this article attempted to address the need to improve the academic achievement of ELLs through high quality professional development and focused teaching strategies. She also explained that when ELLs reached the secondary level, they lag significantly behind their English-speaking peers. Echavarría (2006) saw that explicit vocabulary development was essential to the improvement of ELLs. She stated, "It is through contextual practice that students acquire the depth of knowledge of words that allow them to understand and use those words in meaningful ways" (p. 20).

Technology in Writing

A completely new technological age is greatly adding new dimensions to the writing mediums of students. School technology has taken an increasingly important role in all areas of school improvement. As Yancey (2004) explained, "new digital technologies play a major role in teaching writing for the 21st century" (p. 38). There were many ways technology influenced improved student achievement and the ways students write today.

How had technology influenced the instruction of writing? Technology has influenced students by bringing the resources of larger schools to smaller schools by presenting resources and expertise that they could not otherwise secure. Technology provided learning environments that were assessment-centered. Teachers used technology to obtain formative assessments to evaluate what the student understood. This function was extremely important by giving

immediate feedback to students and teachers. Research showed that immediate feedback increases learning outcomes. Writing consisted of skill development and research. By utilizing internet sources, students and teachers researched all subjects and wrote the most recent information available. Word process technology greatly assisted writers in organizing writing skills and in communicating their writing to others using many multi-media processes.

Urquhart and McIver (2005) expressed the importance of technology by stating:

Just as reliance on the Internet is growing, so is a body of research that supports using technology in the classroom to promote project-based learning, engage students in their learning processes, challenge them to use higher-order thinking skills, and increase problem-solving ability—learning goals for all the content areas. (p. 42)

Gieck and Brabec (2002) acknowledge that technology lends itself well to composing, revising, and sharing in writing. Urquhart and McIver listed some steps that help students benefit from the use of technology and writing in their classrooms:

- Begin by simulating ideas and allowing students to talk about timely and interesting writing topics in your content area. Also guide students to selected Internet sites to find writing prompts or discussion starters. Remember talking before writing serves as a catalyst for more ideas.
- Model for students how to use a word processing program to create an advance organizer will help them organize and develop ideas around their interests.
- Ask students to write for a designated period of time using a word processing program; while students are drafting, encourage the to use the computer to translate their thoughts as completely as possible, making a record of the thoughts.
- Guide the revision process, modeling for students the ways they can use specialized software and program features to check their papers' organization, showing when support is missing or unclear, pointing out redundancies, or looking for key words and transitions that assist readers. Have students work in pairs or in groups of three to suggest revisions to supporting details or descriptions.
- Model editing by demonstrating how to use software programs that help identify run-on sentences and other troublesome sentence structures or to check spelling.
- Publish student papers on Websites or other designated resource pages for other audiences. Publishing student writing can encourage the reluctant writer,

strengthen self-confidence, reward interest, and promote a positive attitude toward literature. (p. 51)

Urquhart & McIver (2002) also listed some tips from the research on technology and writing:

- 1) Provide all students with plenty of opportunities to write, regardless of the amount of technology you have available. Students don't learn just because there is technology in the classroom.
- 2) Teach revision before encouraging students to use the software. Just because the word processing software has revision features doesn't mean students know how to revise.
- 3) Give low-achieving students plenty of opportunities to work on writing skills while at computers. Students with poor writing skills don't see those skills improve just because they use word processing software; they need repeated opportunities. (p. 52)

Goldberg and Cook (2003) did a meta-analysis of studies from 1992-2002 and found that the comparison between paper and pencil and writing with computers on revision produced mixed results. Some studies indicated that the writing process was more collaborative and social in computer classrooms. They found on average, "Students who use computers when learning to write are not only more engaged and motivated in their writing, but they produce written work that is of greater length and quality" (p. 2).

Yancy (2004) listed some other ways technology helped writers and teachers of writing present multiple technologies to all students. Several new technological processes enhanced writing by adding interest. One technological process examined how technology has contributed new avenues to textual writing. Using technology itself was a motivation that often reinforced learning for all students, especially students with limited access to technology. One type of increasingly tried technology that added interest to writing was a digital camera. The digital camera produces digital images to web pages, multi-media presentations, school newsletters, and power-point presentations making them more varied, and attractive to the audience. Along with hardware inventions, many special types of software were used to enhance the writing process.

Inspiration, Kidspiration, and KidPix were software programs that illustrated stories. As visual organizers, these programs assisted writers develop projects, plan papers, and create such items as web pages. Web pages greatly enriched writing and provided detailed facts needed to write informative papers. Another area of technology used more often today were the video cameras that helped students improve their oral communication skills. After viewing their presentations, students viewed them and improved the presented message. According to Yancey (2004), “Writers now compose through new media like email, list servers, and creative software packages. Writers use digital technologies to write many new kinds of texts, such as web logs, hypertexts, and electronic portfolios” (p. 38).

Wiske (2004) found aspects of prewriting enriched the writing by using visually composing models. Helping organize their learning processes reflect on the writing itself, technologies helped list ideas into groups in which writing ideas could be collected. Using technology itself can be motivating to many students. In addition, slide presentations helped organize the writing process. Wiske (2004) stated that, “New technologies can make learning interactive, engaging, collaborative, and linked to the world outside of the classroom” (p. 46).

With a rapidly changing world, Armstrong and Warlick (2004) stated that students today, “Become not only literate but also able to use that literacy within their personal information environment succeed now and in the future” (p. 20). They further challenged all educators to, “Keep up with an information environment that has changed dramatically in the past 10 years, a decade during which the very nature of information has changed in appearance, location accessibility, application, and communication” (p. 20). Stated by Schmeizer (2004),

Practice in writing is the one sure way to improve a student’s writing skills. It is difficult for teachers to provide feedback on each student’s writing drafts, a key component of the ‘learning to write’ process. (p. 20)

Accessing information in an increasing digital world required a range of skills of which reading and writing were only a small part. Basic skills for students listed by Armstrong and Warlick (2004) were as follows:

- *Finding information*: Not just using the library, but the Internet and the World Wide Webs. Using research strategies which would locate the best information.
- *Decoding information*: Reading for meaning and understanding within the multimedia content.
- *Evaluating information*: Students need to evaluate the information and select those which meet their goals.
- *Organizing information into personal digital libraries*: Create and organize information to fit the goals and interest of the researcher and to find answers to our questions. (p. 28)

Writing deals with expressing ideas compellingly. Information grows daily. The writer must be able to successfully select the information that is the most appealing and communicate it efficiently. Students must not only learn the mechanics of writing but also how to communicate knowledge and ideas.

Armstrong and Warlick (2004) stated that, “Students must also learn to match their message with the medium that best communicates it, and then use the appropriate tools to create and or modify it attract the attention of an audience” (p. 28). Students not only need to master the skills to write effectively but also to use technical skills to express ideas effectively.

Anderson (2006) believed that higher level teachers should help writers find power and stated, “By valuing students’ deeper messages and helping them learn from their errors, we can repair writing attitude breakdown. Struggling writers often believe they have nothing of value to say. So first, I have to change that belief and allay their fears” (p.70) .

Anderson (2006) stated that he had discovered three essential processes that open up student writers:

- (1) Valuing what students have to say. He used the following concrete strategies to ensure that students know that he valued their writing.
- Say something good about the content of students' writing before saying anything else. Hands down, that's the most important thing. This is their soul on the page. Be sincere; you don't need to go gooey over everything they produce. But do rummage for and celebrate what they've done well.
 - Push students to live by the maxim "Never a day without a line." The sheer volume of writing that we urge students to produce—in writer's notebooks, reflections, and essays—says a lot to students about how much we value their messages.
 - Become a sentence stalker, hunting down powerful snippets of text in all kinds of writing to help students hear what good writing sounds like rhythmically and syntactically (Spandel, 2004). Have students follow your lead and share their own sentence gems.
 - Ask students to recopy their most successful bits of writing on transparencies, on sentence strips, on index cards, or in their journals. Have them read aloud their efforts that hit the mark, whether it's a lead, a concluding paragraph, or a whole essay. What is celebrated will be repeated.
 - Help students notice what is good with their writing and what is moving in the right direction. Revel in attempts that work and in those that almost work.
- (2) Loving their errors-English teachers should turn students' attentions to creating meaning and not focus on errors. Teachers should concentrate on students' thinking processes and not on how grammatical the writing is.
- (3) Anderson fosters their knowledge on language conventions through visual reminders of underlying grammar patterns. (pp. 70-73)

Technology and school design contributed to student outcomes in writing. Most of the technology in schools was limited in scope. In order for students to acquire the skills to write and utilize technology, schools needed to provide a more technological design and infrastructure conducive for full implementation of digital sources.

Most schools did not wire for the technology they house. Technology is changing so quickly, and schools do not always have the funding to keep up with the rapid changes. Students must have more computers and other technologies available to best utilize the media involved in

integrating technology in their writing and research. As stated by Riel (1994), “The concept of learning has shifted from recitation and recall from short-term memory to a process of constructively using information in a project setting to create new knowledge” (p. 94).

School designs have technologically situated locations that were the hubs of the school. Wiring and specialized networking provided for the maximum connectivity of the students, teachers, and community. Specialized software and equipment provided opportunities for students to effectively organize technology into their papers and share their writings with multiple audiences.

Use of computers for word processing skills and to research information enhanced the writing and presentations of the student writing. Computers also allowed for advanced communication in the worldwide web. (Caroline & Lynch, 2003) explained their research by summarizing the results of the meta-analyses suggest that, on average, students who use computers when learning to write were more engaged and motivated in their writing, and produce written work that was of greater length and higher quality.

Cook and Russel (2003) did a data analysis focused on the effect of computers on student writing focused on three areas: quantity of writing, quality of writing, and the number of revisions, and found that the students with greater access to word processors performed better over time than those who did not.

Speech-feedback and word-prediction software can help students write. When working with special education needs, Williams (2002) reflected that, “Computer software can offer students immediate spelling assistance and can read aloud what they have written, as an aid to revision. (p. 77). She further explained that, “The key will be to use these programs not just for

the sake of using technology, but to match the characteristics of the software with the needs of the student” (p. 78).

Technology needs to be available to all students. Technology needs to be available in schools that were designed to provide adequate support for all the faculty and students. Students should utilize all the technology available to present their writing in the most appealing, informative mode. Writing enhanced by pictures, power-point presentations, and other technological techniques adds to the overall appeal presented to the audience. More audiences were available by placing technologically enhanced writing on the internet or by communicating with others throughout the global community on such mediums as websites. Educators must encourage student writers to open themselves to society by challenging them to communicate their ideas and concerns. Classrooms equipped and wired for the use of the latest media and technology will provide students and teachers the best opportunities to communicate ideas to others in an appealing manner. Writing teachers needed to present technology-filled lessons to reflect the needs of the students and to prepare them for their future.

Many of the strategies of the High Schools that Work (HSTW) initiative reflect five literacy goals improve achievement of high school students:

- Read the equivalent of 25 books per year across the curriculum.
- Write weekly in all classes
- Use reading and writing strategies to enhance learning in all classes.
- Write research papers in all classes.
- Complete a rigorous language arts curriculum taught like college preparatory/honors English. (p. 9)

Many other recommendations based on the 2002 HSTW Assessment were made such as that frequent writing assignments of one to three pages, graded at least once a month improved reading achievement scores in the middle grades, and that students who regularly revised written work improved the quality of their writing and had achievement scores of 27

points higher than students who did not revise their work. Only 28 % of the students stated that they frequently revised their work.

One of the main goals of the HSTW initiative is that students need to use reading and writing strategies to enhance learning in all classes. Reading and writing are critical for learning all content material. Proficient readers and writers use strategies to achieve the most from what they read and communicate their thoughts more effectively.

HSTW stated importantly that, “The greatest barrier in getting more students to the proficient level is most teachers lack expertise in engaging students in reading, comprehending, talking, and writing about the language of the field being studied” (p. 13).

Fisher and Frey (2006) highlighted a school-wide literacy initiative at Hoover High School in San Diego, California. Between 1999-2005, Hoover High School made impressive gains in academic measures even though its 2,100 students all qualified for free lunch and 72% were English language learners.

Hoover High School teachers started by writing a school-wide literacy plan that was evidence-based. Most of the faculty agreed to participate with the plan. The main focus of the plan was that all teachers needed to implement content literacy strategies in their classrooms, and that all learning be language-based. The plan called for everyone to focus on certain prominent strategies and to practice these strategies on a regular basis with their students.

The following are the seven areas on instructional focus that made a difference at Hoover High School:

- Anticipatory activities. KWL, bell-ringers, anticipation guides.
- Cornell note-taking. Students use split pages to take notes on the right side, identify key ideas on the other, and write summaries at the bottom of the page.
- Graphic organizers. Venn diagram, charts, and other organizers.
- Read alouds and shared reading. The teacher reads aloud daily building background knowledge.

- Reciprocal teaching. Student use teaching strategies and work in groups.
- Vocabulary development. Students are taught specific content related vocabulary words.
- Writing to learn. Using writing prompts to provide students to show their understanding. (p. 19)

After more than five years of success at Hoover High School, there were lessons of success in using a whole school literacy initiative. Along with the language focus, Hoover High School placed an emphasis on professional development and teacher implementation. These were keys to their academic success.

Summary

Writing is a complex skill that demands instruction, training of teachers and students, and improved literacy skills. Denti (2004) emphasized this by stating, “Very few secondary level teachers have received the necessary preparation to assist students to improve their literacy or to accommodate curriculum for low reading levels” (p. 115). Not only does it take supportive leadership and involved trained teachers to make writing improvements in a school; but also, it takes one that supports writing across other content areas. Staff development in teaching strategies is critical to improved writing success. As stated by Thomas (2000), teachers must foster writing by having “access to the research of teaching writing, ample support from master teachers, and extensive experiences as writers themselves” (p. 41). Most authorities in composition have identified the following stages of writing: prewriting, drafting, revising, editing, and publishing. Harris and Graham (1992) found that writing products improve as students practice the stages of the writing process. More time needs to be allowed for pre-writing as it is one of the most important aspects of writing (Zipprich, 1995). Special needs students have improved in writing skills following instruction in narrative structure (Graham & Harris, 2000).

The most common elements of narrative structure are setting, problem, goals, action, and outcome.

Technology is a new arena for writing. As long as technology enhances the writing process and does not replace practice in writing skills, technology will be an asset.

Levy and Murmane (2004) related that:

An education centered on complex thinking and communicating is a graduate's passport to prosperity... the great danger is the continuing decline in earnings opportunities for people who lack the skills to do work requiring expert thinking and complex communication. (p. 80)

Rabin (1990) summarized the writing process well when she stated,

People write because they believe they have something to say, not demonstrate their knowledge of sentence structure, grammar and spelling. The most satisfying part of teaching writing is helping students to discover what they have to say and then showing them how to say it fully and effectively. Writers need good advice from readers who know what constitutes good writing. Giving that advice is called teaching writing. (p. 44)

Stated in the *Newsleader* (Dec. 2005), national organizations such as the National Association of State Boards of Education (NASBE), the National Governors Association (NGA) and the International Reading Association (IRA) all released reports in October and November to draw attention to the deficiency of reading and writing literacy skills of adolescent students in the United States. NASBE called for a shift in literacy standards by encouraging states to place literacy plans across all content areas and throughout middle and high schools. The NASBE alarmingly presented the data from the 2003 National Assessment of Educational Progress (NAEP) that showed that 68% of eight-grade students read at the basic or below-basic level, and most of the students are at risk of dropping out.

The authors of the *Newsleader* further stressed the concentration of reading and writing at the elementary level because of the federal government's Reading First program that focuses on

grades K-3; not much instructional change has taken place on the secondary level. More national initiatives involving writing at the secondary level needs to take place.

An emphasis on writing on the national and state levels on testing for graduation from high school and placement into colleges has pushed writing to the top of the academic reform movement.

Research showed that writing skills such as organizing thoughts and improving critical thinking skills are critical to student academic achievement at all levels of instruction. Writing across all content areas, including physical science in this study, improves learning comprehension and critical skills across all curriculum levels. The *Writing to Win Program* was used in this study to test the effect of writing in the content area of physical science.

CHAPTER THREE

METHODOLOGY

Introduction

This study examined the physical science results of the *Writing to Win Program* implemented in 2006 in selected science classes at the high school level. In addition, this study examined if there were statistically significant differences in the physical science achievement scores of students exposed to the *Writing to Win Program* developed by Combs (1986) than those who were not exposed to the program. After a nine-weeks grading period, Group A, composed of physical science students who were instructed in writing strategies along with physical science, and Group B, composed of students who were only instructed in physical science, were examined for statistical differences in academic achievement. Group A was composed of 51 students (21 males, 30 females and 31 black, 20 white students). Group B was composed of 40 students (26 males, 14 females and 25 black, 15 white students).

The purpose of this study was to determine if incorporating the *Writing to Win Program* strategies in physical science classes would make a significant difference in physical science scores given over a nine-week course of study. *The Writing to Win Program* placed an emphasis on journal writing strategies within the framework of physical science. Two physical science classes, Group A, were taught the *Writing to Win Program* and two similar physical science classes, Group B, were not exposed to the writing strategies. Groups A and B were statistically examined for differences in scores from the pretests and posttests.

Data used in this study were collected from the pretest and posttest scores given at the beginning and the end of the nine-week's period of physical science instruction. The pretests and

posttests were identical and developed by one of the teachers based on the requirements of the course as required by the Georgia Performance Standards for physical science.

(See Appendix D). Both teachers taught the same physical science curriculum. They worked closely together on the presentation of the material, except the teacher of Group A taught the *Writing to Win* strategies and the teacher of Group B did not.

Design of the Study

The design of the study was a two-group, pretest-posttest design where there existed a pretest, a treatment, and a posttest (Campbell & Stanley, 1963). Two college preparation physical science classes were exposed to the *Writing to Win Program* were compared to two comparable physical science classes that were not exposed to the *Writing to Win Program*. An identical pretest was administered to all four classes determine their background knowledge prior to instruction. The same test was administered at the end of the nine weeks of instruction as the posttest determine the effectiveness of writing strategies on physical science achievement. The study took place in the second semester of high school involving 91 students, mostly freshman. Only three tenth and eleventh grade students were involved in the study.

The Independent Variable

The Writing to Win Program was the independent variable in this research design that promoted the use of journal writing as a means of improving student achievement in science. Two teachers involved in the physical science instruction were selected for this study because they taught the same level college-preparation physical science courses. One of these teachers was taught the *Writing to Win Program* in the Fall of 2005 at the selected high school. This trained teacher was selected to administer the *Writing to Win* strategies to his two physical science classes forming Group A. Group B, also consisting of two physical science classes, was

taught by the untrained teacher. Group B was not taught writing strategies just physical science material.

The Dependent Variable

The posttest was the dependent variable. The pretests and posttests were teacher-prepared questions that reflected the material expected to be taught based on the Georgia Performance Standards. The pretests were administered on the second day of school to all four physical science classes, and the posttest was given the last week of the nine week classes. *The Writing to Win Program* (Combs, 2006) was taught by one teacher in two classes. The program was not taught by the other teacher in the other two classes. However, all students were tested on the same pre/post tests at the same time. The pretests and posttests administered were the identical tests composed of 39 multiple choice questions. See Appendix D for a copy of the pretest and posttest used in this study.

Data Collection Procedures

Test scores from the pretests and the posttests were used to determine the effectiveness of the writing program. The resulting data were disaggregated into several subgroups: gender, race/ethnicity, and students receiving the treatment and those not receiving the treatment. The scores from the study were collected and analyzed to determine if any statistically significant differences in scores were noted. Analyzing data collected from the classes and the test results, the researcher compared students' academic physical science scores between the two groups.

The Research Question

How effective was the *Writing to Win Program* in determining academic achievement in physical science?

Sample

The high school involved in this study was a school-wide Title I school with over 70 % of the students qualifying for free or reduced lunches. Many students at this high school were at-risk and experienced academic failure, poor attendance, and language deficiencies. This school was in the second year of not meeting Annual Yearly Progress (AYP). Many of the students were from single-parent homes where there was limited parental involvement. There were approximately 900 students attending the high school that was located in a small city school system in middle Georgia.

The only middle school in this city school system filtered into the only high school in the system. The school system consisted of one K-1 school, one 2-3 school, and one 4-5 school. There were approximately 3200 students in the total school system.

Two classes forming one group of students taking high school physical science enhanced by the writing strategies of the *Writing to Win Program* and another similar group of two classes of students taking high school physical science without the writing strategies were the sample classes in this study. All classes were chosen because they were as comparable to one another as possible. Students were selected into classes as normally scheduled by the high school.

Validity

Cresswell (2000) asserted that validity is seen as a strength of research, "Validity is used to suggest whether findings are accurate from the standpoint of the researcher, the participant, or the readers of an account" (pp.195-196).

Students were divided into two groups of college-preparation students who were assigned to classes randomly by the computer into four physical science classes. The same material was taught to all the classes. Both groups were taught by teachers who were certified in physical

science. All students were exposed to the same physical science curriculum for the same amount of time. The only difference was the use of writing strategies by one group but not the other.

Test Validity

The pretests and posttests used in this study were identical tests. All pre-tests were given on the same day to all students involved in the study and graded the same way. Posttests were also given by both teachers at the same time. A total of 39 points was possible on each test. The teacher-designed test addressed the required Georgia Performance Standards (GPS) for physical science. The test format consisted of true and false and multiple-choice items.

Reliability

“In a research design reliability is based on if the study is repeated, it will get the same results” (Merriam, 1988, p.170). The same physical science test was administered to the students in all the groups as a pretest and as a posttest. Test – retest reliability was $r = .54$.

Null Hypothesis

H_0 There will be no statistically significant difference in the mean scores of the pretests and posttests of the physical science classes based on the implementation of the *Writing to Win Program* strategies.

Analysis of Data

The scores of all the students who took the pretests and posttests in physical science were collected and organized by groups. An analysis of the data was conducted. The scores from the two tests were compared to determine if there was a statistically significant difference in adjusted mean scores with the implementation of the *Writing to Win Program*. Data was disaggregated by race/ethnicity, gender, and the students who received the writing instruction and those who did

not. Using an analysis of covariance, the researcher analyzed the pretest and posttest scores to determine what significant results were found, if any.

CHAPTER FOUR

RESULTS OF THE STUDY

Effectiveness of Writing Strategies

The results of this study rejected the Null Hypothesis that there would not be statistically significant differences in the mean scores of the pretests and the posttests of the physical science classes based on the implementation of the *Writing to Win Program*. The study found that Group A, that included students who were exposed to the *Writing to Win* strategies, learned and retained more physical science material than the students in Group B, who had not been exposed to the writing strategies. (See Table 1)

The study found that students who wrote journal entries, according to the *Writing to Win Program* in their physical science classes, made greater academic gains during the nine weeks than those who had not. Table 1 showed that the students who received the writing strategies began at an average of 16 test items correct out of 39 on the pretest and moved to a 23.9 item average out of 39 items on the posttest after nine weeks of instruction. Group B, that did not receive writing strategies, went from a 14.1 pretest score to a 15.8 posttest score which was 6.2 points less gain than the other group.

With the *Writing to Win* strategies, the standard deviation moved from 4.12 to 5.29 after the posttest. The adjusted posttest score of Group A, who used writing in their physical science classes, was 23.5 points with a .65 standard error of measurement. Table 1 also showed that the students in Group B, who did not receive the writing strategies in their physical science class, achieved a 14.1 test average with a 4.90 standard deviation on the pretest to a 15.8 average test

score with a 4.79 standard deviation on the posttest. Table 1 also listed the adjusted posttest score of Group B as a 16.3 average score with a standard error of .74. The adjusted posttest scores showed that the students exposed to writing made a 7.2 point gain over those students who did not learn writing strategies. *The Writing to Win Program* showed significant results based on the improvement of physical science.

Table I

Writing to Win

Results

<i>Writing to Win</i>	Pretest (SD)	Posttest (SD)	Adjusted Posttest (SE)
Y	16.0 (4.12)	23.9 (5.29)	23.5 (.65)
N	14.1 (4.90)	15.8 (4.79)	16.3 (.74)

Examining the pretest without the writing strategies as a covariate using ANCOVA, Table 2 listed its mean square as 433.75, the degrees of frequency (df) as 1, the F as 20.52, and the significance as .000. ANCOVA evaluated differences between two or more groups or dependent variables. With the exposure of the *Writing to Win Program*, the mean square was 1109.57, the df of 1, F of 52.50, and a significance of .000. The writing strategies showed an increase of 675.82 mean squares, the same degrees of frequency, and a F of 31.98 gain over the non-writing classes. The use of the *Writing to Win Program* showed more academic improvement in physical science than the group that did not utilize the writing strategies.

Table 2

ANCOVA

Results of Study

Source	MS	df	F	<i>p</i>
Pretest (covariate)	433.75	1	20.52	.000
<i>Writing to Win</i>	1109.57	1	52.50	.000 *
ERROR	21.13	88		

* $p < .000$ *Effects of Gender*

Table 3's data revealed the following: Group A's females averaged a pretest score of 16.10 that was 3.81 above the female score of Group B without the writing strategies. The average posttest score for Group A, with the writing incorporated into the science, was 23.70 points that was 9.91 points higher than Group B's female students. The adjusted posttest scores were 23.52 points to 15.99 points, with Group A at the higher level for females.

Group A's males, who were exposed to writing strategies, achieved on the pretests at a lower level than Group A's females by .24, but both groups of males performed at a higher level than the females from Group A with the writing strategies on the pretest. The posttest scores of the males in Group A were an average score of 24.10 compared to 16.81 for the males in Group B with the writing, a difference of 7.29. The adjusted posttest levels also showed a 7.53 gain for Group A's males over Group B's males. Although some differences were noted between the girls and the boys, the differences were not significant to race.

Table 3

Gender

In the Writing Study

Writing to Win	Number St.	Sex	Pretest (SD)	Posttest (SD)	Adjust Posttest (SE)
Y	30	F	16.10 (4.21)	23.70 (4.78)	23.52 (.66)
N	14	F	12.29 (4.12)	13.79 (3.12)	15.99 (.78)
Y	21	M	15.86 (4.08)	24.10 (6.07)	23.52 (.66)
N	26	M	15.12 (5.08)	16.81 (5.23)	15.99 (.78)

Effects of Race

Table 4 used a two-way ANCOVA applying gender and the treatment program. Although some differences were noted between males and females, there was not a significance difference shown based on the students' gender in this study. According to Table 4, the gender of the students was not significantly responsible for the improvement in academics shown on the posttests; only the *Writing to Win Program* was shown significant.

Table 4

Two-Way ANCOVA

Gender

Source	MS	df	F	<i>p</i>
Pretest	377.05	1	17.71	.000
WTW	1118.09	1	52.50	.000
Sex	24.93	1	1.17	.282
WTW*Gender	7.15	1	.34	.564
Error	21.30	86		

Table 5 showed the results of race to the writing study. In examining the pretests, the white students in Group A achieved higher than the black students by a difference of .66. At the beginning of the study, black students in Group A achieved 2.86 points higher on the average than the black students in Group B. This factor showed why the adjusted posttest scores were calculated. When the posttest scores were taken into consideration in Table 5 and Table 6, race was not determined to increase academic posttest scores at a significant rate. Students of all races improved using writing strategies. Both black and white students improved with the writing strategies. Students of all races showed less academic improvement in physical science when not using the writing strategies.

Table 5

Race Factor

In the Writing Study

Writing to Win	Number St.	Race	Pretest (SD)	Posttest (SD)	Adjust Posttest (SD)
Y	20	W	16.40 (4.10)	23.80 (5.51)	23.46 (.66)
Y	31	B	15.74 (4.18)	23.90 (5.24)	23.46 (.66)
N	15	W	16.20 (4.92)	18.53 (5.38)	16.59 (.75)
N	25	B	12.88 (4.55)	14.08 (3.55)	16.59 (.75)

Table 6

Two-Way ANCOVA

Race

Source	MS	df	F	<i>p</i>
Pretest	328.56	1	15.88	.000
WTW	969.85	1	46.87	.000
Race	33.81	1	1.64	.205
WTW*Race	59.10	1	2.86	.095
Error	20.69	86		

CHAPTER FIVE

CONCLUSIONS OF THE STUDY

Summary of the Study

The *Writing to Win Program* significantly improved academic achievement in the area of physical science. Both male and female students achieved at about the same level in this study. In this study, r both black and white students achieved statistically at the same level in this study. Race was not a significant factor in student achievement. Both black and white students achieved statistically at the same level. Therefore, neither race nor gender affected the improvement of academic achievement in this study. Only the use of the *Writing to Win Program* was found to be significantly effective in the improvement of physical science achievement.

All students who participated in journal writing improved in academic achievement in science regardless of race or gender. Chinn and Hilgers (2000) found writing to play an important role in science improvement. They found that writing improved critical thinking skills, and therefore improved student achievement. This study reinforced their research. Hartman and Glasgow (2002) found that writing was a tool for communication and learning content relevance to science. They also found that writing about realistic activities improved frequent interactions among students and instructors. Improved writing expression was linked to fluency in writing. The more the students wrote, the better their writing became. This aspect of the study was not specifically examined; however, journal writing in the *Writing to Win Program* involved seven strategies for critical thinking and a method of self-checking. The teacher who used writing in

this study found that the more writing experience of students, the better the writing expression became. Further studies need to be held to evaluate the writing improvement itself and to examine how effective the system of self-checking, which is part of the *Writing to Win Program*, was to the writing process.

Nagin (2003), who researched the status of writing for the National Writing Project, found writing led to higher level learning in a variety of content areas. This study also found that writing was important to learning in the content area of science. In studies where writing science journals were used, Nagin found students made more progress in learning. He stated that National Writing Project teachers treated writing as fundamental to teaching across all subjects and integrated it into the curriculum.

Wanket (2005) expressed the benefits of journal writing. Having guided students through daily journal writing for 15 years, she recognized five basic benefits of journal writing. Of these, she found that students who used journals grew in reflection on what they learned and how it relates to their emotional and social lives. In this study, students reflected daily on what had been taught in physical science. This reflection helped students retain information and do better on the tests.

Implications of the Study

There were several implications for the classroom based this study. Writing improved the academic achievement in physical science. Urquhart and McIver (2005) and others stated that writing across the content areas improved academic achievement. This study found this to be true for physical science. Writing made a difference in academic improvement when incorporated into the science curriculum. Although some researchers have found race and gender to have greatly affected differences in academic achievement, this study did not confirm this.

According to the results of this study, race and gender were not factors in academic improvement.

Further study needs to take place for the *Writing to Win Program* to be examined in other content areas. Additional studies needs to be made to determine if the results of this study would remain the same over a longer time period of one semester or a full year. Writing samples taken before and after the exposure of writing needs to be examined and graded by a rubric document growth in writing as well as growth in academic achievement. In the future, more data needs to be documented concerning the socio-economic status of students. Special education students who were mainstreamed into the study would also add important information to further studies.

Conclusions of the Study

Writing was critical to student reflection and communication in the area of physical science achievement. More emphasis needed to be placed on writing in all curriculum areas, not just in English classes. Studies such as this, based on classroom data, need ed to take place to help students reflect on their learning and to allow teachers to determine if students learned the concepts taught.

De La Paz (2001) conducted a study concerning difficulties with written language production among students with learning disabilities and found that writing instruction had a positive effect to the students' approach to writing and to overa ll writing performance. More special education students will be included in the regular classroom as was in this study and found to improve in physical science improvement when writing skills were incorporated.

Graves (2001) gave two main reasons for the lack of attention to writing. One was that textbooks do not endorse writing, and the other was that teachers were not prepared to teach writing. Since Graves wrote about the lack of attention to writing, much has been devoted to the

search for understanding about writing and how to teach writing. Most successful literacy programs have built into them high quality professional development programs to build teacher knowledge. Teachers need to be taught how to teach writing and to introduce successful writing strategies such as those in the *Writing to Win Program*.

In secondary schools, teachers traditionally work in defined subject areas and very few have had the preparation to assist their students improve their literacy or to accommodate the curriculum for low reading levels. Denti and Guerin (2004) summed up their research by stating that all students, but especially low achieving students, need in-class learning strategies and accommodations to improve academic competency in content areas. This study found this to be true. Students who received in-class writing strategies improved more academically in physical science than those who did not.

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Appendix A

The Georgia High School Graduation Tests

The Georgia Department of Education presented this information of the Georgia High School Graduation Tests. The students pass the Georgia High School Graduation Tests (GHSGT) receive a high school diploma. The areas of testing are reading, writing, mathematics, social studies, and science. The law emphasized that these tests include process and application skills. These tests must be taken by all students who entered ninth grade since July 1, 1991. Students must earn a passing score on each of the required tests earn a diploma.

Students take the graduation tests for then first time in their junior year. The Writing test is given in the fall and the four content area tests in the spring. Students have five opportunities to take each of the tests before the end of the 12th grade.

The GHSGT in Writing involves students writing a persuasive essay on an assigned topic. The essay is judged by trained professionals who look for four qualities or “domains” of effective writing: content/organization, style, conventions of written writing, and sentence formation.

Content/Organization counts twice as much as the other three domains.

Domain 1: Content/Organization: The writer uses examples, illustrations, facts, or details to provide order that is clear and relevant.

Domain 2: Style. Writers control language to establish their own identities.

Domain 3: Conventions of Written Language. Writers use the written standard American English.

Domain 4: Sentence Formation. Writers form sentences correctly.

Georgia Department of Education, 1999. Retrieved on June 6, 2004 from

<http://www.doe.k12.ga.us/curriculum/testing/ghsgt.asp>

Appendix B

The National Commission on Writing

The National Commission on Writing's summary in *Writing: A Ticket to Work or a Ticket Out* (2004, pp.22-24) stated that the Nation must put a renewed interest on writing devoting time and resources to improve writing and recommended a writing agenda for the Nation:

- Every state should revisit its education standards to make sure they include a comprehensive writing policy.
- That policy should aim to double the amount of time most students spend writing, require a writing plan in every school district, insist that writing be taught in all subjects and at all grade levels, and require successful completion of a course in writing theory and practice as a condition of teacher licensing.
- National political leadership should put the power of the bully pulpit to Work through a national conference on writing.
- Higher education should address the special roles it has to play in improving writing. All prospective teachers, no matter their discipline, should be provided with courses in how to teach writing. Meanwhile, writing instruction in colleges and universities should be improved for all students.
- States and the federal government should provide the financial resources necessary for the additional time and personnel required to make writing a centerpiece in the curriculum.
- The amount of time students spend writing (and the scale of financial resources devoted to writing) should be at least doubled.
- Writing should be assigned across the curriculum.
- More out-of-school time should also be used to encourage writing, and parents should review students writing with them.

TIME

- The amount of time students spend writing (and the scale of financial resources devoted to writing) should be assigned across the curriculum.
- Writing should be assigned across the curriculum.
- More out-of-school time should also be used to encourage writing, and parents should review students' writing with them.

MEASURING RESULTS

- Public and private leaders and assessment experts must ensure that assessment of writing competence is fair and authentic.
- Standards, curriculum, and assessment must be aligned, in writing and elsewhere in the curriculum, in reality as well as in rhetoric.
- Assessments of student writing must go beyond multiple-choice, machine-scorable items. Assessment should provide students with adequate time to write and should require students to actually create a piece of prose.
- Best practice in assessment should be more widely replicated.

TECHNOLOGY

- Government should extend the underlying premise of recent federal telecommunications policy by recognizing that the national technological infrastructure for education is as critical to the United States in the twenty-first century as highways were in the twentieth. The can do so by creating a National Educational Technology Trust to finance hardware, software, and training for every student and teacher in the nation.
- Private and public leaders should work with educators to apply new technologies to the teaching, development, grading, and assessment of writing.
- The nation should invest in research that explores the potential of new and emerging technologies to identify mistakes in grammar, encourage students to share their work, help assess writing samples, and incorporate software into measuring student writing competence.

TEACHERS AND PROFESSIONAL DEVELOPMENT

- Writing is everybody's business, and state and local curriculum guidelines should require writing in every curriculum area and at all grade levels
- Writing opportunities that are developmentally appropriate should be provided to every student, from the earliest years through secondary school and into college.
- Common expectations about writing should be developed across disciplines through in-service workshops designed to help teachers understand good writing and develop as writers themselves.
- Universities should advance common expectations by requiring all prospective teachers to take courses in how to teach writing. Teachers need to understand writing as a complex (and enjoyable) form of learning and discovery, both for themselves and for their students. Faculty in all disciplines should have access to professional development opportunities to help them improve student writing.
- University-school partnerships should encourage greater experimentation and the development of new model programs to improve teaching and learning for English-language learners.

AN ACTION AGENDA

To move this national writing agenda forward, the Commission proposes a five-year Writing Challenge for the nation and seeks the support of leaders from education, government, business, and the philanthropic world. The Challenge should issue progress reports, map the terrain ahead, and provide assistance to educators on the many details that remain to be ironed out on topics such as writing assessments and the use of technology.

Appendix C

Overview of Writing Assessment in Georgia

In Georgia, writing is evaluated in terms of content (development and organization), style (personal expression), and the conventions of Standard American English (surface features, sentence formation, usage, and mechanics).

Middle Grades (8 th)	Narrative, Expository, Persuasive	<u>Analytic: Five Domains</u> Content/Organization Style Sentence Formation Usage Mechanics	1-4 per domain	<u>Scale Scores: 300-400</u> Not on target 300-348 On target 349-367 Exceeds Target 368-400	Qualified Raters
GHSWT (11 th)	Persuasive	<u>Analytic: Four Domains</u> Content/Organization Style Conventions Sentence Formation	1-4 per domain	<u>Scale Scores: 400-600</u> Fail 400-499 Pass 500-600	Qualified Raters

Georgia Department of Education (2002), Middle Grades Writing Assessment Test and GHSWT, Summary, p. 20

- _____ 11. The elements that make up a compound and the exact number of atoms of each element in a unit of the compound can be shown in a _____.
- a. chemical formula
 - b. chemical symbol
 - c. subscript
 - d. superscript
- _____ 12. A chemical bond that occurs when atoms share electrons is a (n) _____ bond.
- a. covalent
 - b. ionic
 - c. magnetic
 - d. polyatomic
- _____ 13. The oxidation number of an atom is shown with a _____.
- a. negative number
 - b. positive number
 - c. subscript
 - d. superscript
- _____ 14. What kind of chemical bond is formed when an equal exchange of electrons occurs?
- a. covalent
 - b. hydrate
 - c. ionic
 - d. magnetic
- _____ 15. What is the total number of atoms in the compound $\text{Ca}(\text{ClO}_3)_2$?
- a. 2
 - b. 3
 - c. 5
 - d. 9
- _____ 16. How many hydrogen atoms are present in one molecule of ammonium acetate. $\text{NH}_4\text{C}_2\text{H}_3\text{O}_2$?
- a. 4
 - b. 7
 - c. 11
 - d. 12
- _____ 17. Why do the noble gases NOT form compounds readily?
- a. They have empty outer energy levels.
 - b. They have no electrons.
 - c. They have seven electrons in the outer energy levels.
 - d. Their outer energy levels are completely filled with electrons.
- _____ 18. What is the number of potassium atoms compared to oxygen atoms in a binary compound made from these two elements?
- a. One potassium atom to two oxygen atoms.
 - b. One potassium atom to three oxygen atoms.
 - c. Two potassium atoms to one oxygen atom.
 - d. Three potassium atoms to one oxygen atom.
- _____ 19. What is the name of a binary compound made up of lithium and chloride?
- a. chorine lithiate
 - b. chorine lithium
 - c. lithium chloride
 - d. lithium chlorate
- _____ 20. Which of the following is the correct formula for magnesium nitrate?
- a. MgNO_3
 - b. Mg_2NO_3
 - c. $\text{Mg}(\text{NO}_3)_2$
 - d. $\text{Mg}_2(\text{NO}_3)_2$
- _____ 21. What is the correct formula for magnesium oxide?
- a. MgO
 - b. MgO_2
 - c. Mg_2O_2
 - d. Mg_2O
- _____ 22. At room temperature, most metals are _____.
- a. gases
 - b. liquids
 - c. radioactive
 - d. solids

- _____ 23. Substances that conduct an electric current only under certain conditions are most likely to be _____.
- a. metals
 - b. metalloids
 - c. noble gases
 - d. nonmetals
- _____ 24. Different forms of the same element that have different properties because of different atom arrangements are called _____.
- a. allotropes
 - b. carbons
 - c. graphites
 - d. halogens
- _____ 25. An allotrope of carbon that is soft and can be used as a lubricant is _____.
- a. diamond
 - b. graphite
 - c. sand
 - d. silicon
- _____ 26. Hydrogen is grouped with the alkali metals because it _____.
- a. does not readily form compounds
 - b. has one electron in its outer energy level
 - c. is a gas
 - d. is a metal
- _____ 27. A chemical family whose members exist as reactive diatomic molecules in the gaseous phase is the _____.
- a. actinide series
 - b. alkali metals
 - c. halogens
 - d. lanthanide series
- _____ 28. A family of elements that has two electrons in its outer energy level is the _____.
- a. actinides
 - b. alkaline earth metals
 - c. alkali metals
 - d. halogens
- _____ 29. Metals can be used as wire because they are _____.
- a. alloys
 - b. ductile
 - c. metallic
 - d. shiny
- _____ 30. Elements in which the outer electrons are NOT held tightly are most likely to form _____ bonds.
- a. covalent
 - b. hydrogen
 - c. metallic
 - d. radioactive
- _____ 31. The only metal that is a liquid at room temperature is _____.
- a. copper
 - b. mercury
 - c. silver
 - d. sodium
- _____ 32. Three transition elements in Group 12 of the periodic table are _____.
- a. copper, silver, and gold
 - b. iron, nickel, and cobalt
 - c. mercury, zinc, and cadmium
 - d. neon, helium, and xenon
- _____ 33. The noble gases are in _____.
- a. Group 18
 - b. Group 1
 - c. Group 13
 - d. Group 2
- _____ 34. Elements that lie along the stair-step line of the periodic table are _____.
- a. liquids
 - b. metals
 - c. metalloids
 - d. radioactive
- _____ 35. The appearance of solid metals can be described as _____.
- a. dull
 - b. glassy
 - c. powdery
 - d. shiny

- _____ 36. A family of elements that contains the most reactive metals is the _____.
- | | |
|--------------------------|------------------------|
| a. noble gases | c. alkali metals |
| b. alkaline earth metals | d. transition elements |
- _____ 37. How many electrons does a carbon atom have in its outer energy level?
- | | |
|------|------|
| a. 2 | c. 6 |
| b. 4 | d. 8 |
- _____ 38. Although ceramics are strong, they break if dropped because they are _____.
- | | |
|--------------|-----------|
| a. malleable | c. alloys |
| b. brittle | d. glass |
- _____ 39. Gold that is used to make jewelry is often made up of gold and _____.
- | | |
|-------------|-----------|
| a. aluminum | c. silver |
| b. copper | d. steel |

Appendix E
Writing Philosophy

- Writing is a lifelong process.
- Writing matters well beyond the academic context.
- Writing instruction begins long before preparation for a statewide test.
- Writing instructors and students alike are lifelong learners.
- Writing is interdisciplinary. English/language arts teachers provide the “How to,” while all teachers provide the essentials of “what to” write.
- The goal of teaching the writing process is to create writers who can carry themselves through the process.
- The writing process yields a product. In the classroom, both process and product can be evaluated. In assessment, the product alone is evaluated.
- Effective writing in all disciplines shares the same qualities. Writing is, thus, interdisciplinary in nature.

Georgia High School Writing Test:

Georgia Dept. of Education (p. 9)