THE IMPACT OF A SCIENCE PROFESSIONAL DEVELOPMENT PROGRAM ON STUDENT ACHIEVEMENT IN HIGH SCHOOL

by

STEVEN WILLIAM FLYNT

(Under the Direction of C. Thomas Holmes)

ABSTRACT

The purpose of this study was to determine the effectiveness of a science professional development program as it related to Dacula High School's student scores on the science portion of the Georgia High School Graduation Test (GHSGT) over a two-year period (2001-2002 and 2002-2003). All data were collected from existing records from Dacula High School in Gwinnett County, Georgia.

The professional development program activities provided release days and contract time for teachers to work together on strategies to increase student achievement on standardized high-stakes tests, specifically the GHSGT. These professional development activities focused on scoring techniques, knowledge, and process skills. Teachers were given specific activities to implement in their classes and time to observe other teachers in similar activities. The study was comprised of all regular education

students at Dacula High School who were in their junior year and who were taking the GHSGT for the first time. The standard scaled score was used for ITBS (covariate) scores as well as for the GHSGT scores for all the students in this study. There were a total of 1205 students in the study. The research design was an ex-post facto study using analysis of covariance.

The results of the analysis of the data indicated that the Dacula GHSGT science professional development program was statistically significant in increasing student scores on the science portion of the GHSGT. The professional development program showed an increase in effectiveness during the second year it was implemented. The data were disaggregated by student gender, ethnicity, and income level. The results of the study indicated that the program was equally effective for all groups of students.

INDEX WORDS: professional development, local school plan of improvement.

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TABLE OF CONTENTS

Page

LIST OF TABLES

Page

LIST OF FIGURES

Page

CHAPTER 1

INTRODUCTION

Accountability has become a driving force in the educational arena. Rothman (1995) described how "school districts have not only implemented testing programs but have also made sure that there are consequences – real or perceived – attached to the results" (p. 43). Schools are pushed not only to perform on standardized tests but also to implement school based action research and evaluation based on those results. According to Schlechty (1990):

> In a results based evaluation system, the primary concern is to provide data that will make it possible to assess performance, determine the extent to which performance conforms, and, where performance does not conform with the requirements provide a basis for determining why this is the case and what can be done to correct the problem. (p. 111)

Schools not only are asked to implement multiple local, state, or national tests, but also they are required increasingly to provide a plan of improvement based on the scores their students receive on these tests.

Dacula High School has been a results oriented school using action research to increase student achievement. Dacula High School collects achievement data on the students' and then seeks to improve the outcome though the Results Based Evaluation System (RBES) program. The RBES program is a system-wide (Gwinnett County) teacher evaluation system in which teachers set specific attainable goals for themselves and their students then strive to accomplish them.

Schmoker (1999) in the book, *Results: The Key to Continuous School Improvement,* explained the practices and foundational theories that enabled Dacula High School to bring about increases in student achievement. Dacula High School implemented the "results cycle: setting specific targets, teamwork, measurement and feedback, and redefining goals" (p. 8). This data collection may "initially make some educators uneasy", however, the Dacula High School faculty used strategies for reducing the threat of reporting data without eliminating accountability (p. 8). Schmoker discussed the myth of low expectations and explained how to remove the concern that "a focus on results will leave the low-achievers and students from low socioeconomic background behind" (p. 12).

The Gwinnett County School System has taken a results oriented approach to increasing student achievement. The RBES program is based on involving teachers and administrators in the data and development process. In this program each school developed a clearly defined goal with supporting goals, which allowed for teacher individuality and improvement. According to Schmoker (1999), the process of collaboration might even be as beneficial, if not more, than the actual product that is created (p.12). Peer and departmental collaboration allowed for discussion of possible deficiencies and solutions. In addition, Smoker (1999) stated how "this process takes time but the changes and data collection can be immediate" (p. 8).

Dacula High School offered a variety of opportunities for teachers to improve their instruction. Some examples are RBES goal plans, school-based professional development, and classroom observations. Teacher RBES and Local School Plan of Improvement (LSPI) initiatives contained measurable goals to enhance student learning

and provided evidence of professional development plans that were aligned with the school's mission of "Focused on Learning." To enhance this plan of improvement the Georgia High School Graduation Test (GHSGT) scores were compared with previous years' scores to determine if progress was being made. Appropriate adjustments and renewed instructional emphasis were made in areas of concern. Additionally, professional development, conference attendance, and other opportunities to enhance professional development evidenced the allocation and use of resources to improve learning of the faculty and students.

Teachers developed personal, professional, and departmental goals (RBES) to focus on improvement of student learning. The teachers evaluated these goals and discussed them with their assigned administrator at the end of each year. Together, they made adjustments for the following year and set new goals based on the findings of the current year. School cabinet meetings, which consisted of administrators and instructional lead teachers, focused on identified concerns of the school. The Cabinet discussed solutions and/or recommendations and then shared them with the various departments.

The faculty and staff should be a school's most important resource. When teachers are exposed to additional ideas and methods, they may become more creative. Professional development can open up many doors for professional growth. Teachers need to be provided as many opportunities as possible to grow individually and professionally through professional development activities. When teachers, administrators, and other staff members find something that works, it needs to be shared with others. Professional development activities provide an effective forum to share in

these resources. Involving all the staff members in the development process will provide a plan in which the school, as a whole, can have the freedom to take risks and develop new and creative strategies to deal with many different situations. The plan for improvement was depicted in the Local School Plan for Improvement (LSPI), which was updated annually.

Statement of the Problem

The problem of this study was to determine if implementing a science professional development program would increase student achievement on a high school graduation test. Students in their junior year of high school must take the GHSGT in the areas of language arts, mathematics, social studies, and science. The State of Georgia requires a passing score on each area of this test before a student is eligible to receive a regular education diploma from high school. Scores on the science portion of the GHSGT at Dacula High School were low during the five years prior to the 2001-2002 school year compared to similar schools within the county and state.

Purpose of the Study

The purpose of this study was to determine the effectiveness of the GHSGT Science Professional Development Program as it related to Dacula High School's student scores on the science portion of the GHSGT over a two-year period (2001-2002 and 2002-2003 school years). Dacula High School implemented specific strategies for improving scores on the science portion of the GHSGT beginning with the 2001–2002 school year and continuing for future years based on the program's effectiveness. Dacula High School's Local School Plan for Improvement starting with the 2001–2002 school year provided a professional development program to help teachers implement strategies

that would provide students additional support in the area of science. The results of this study will be helpful in developing future professional development programs at Dacula High School in addition to other Gwinnett County High Schools.

Importance of the Study

The idea of creating high-stakes tests in order to guide instruction and curriculum is a growing trend across the United States. Several states have implemented programs to join this trend. For example, Texas uses the Texas Assessment of Academic Skills (TAAS), which is similar to the GHSGT, in that high school students are tested in the areas of science, language arts, social studies, and mathematics. Other examples are the benchmarks in Arkansas, the Instructional Results Information System in Kentucky, and the social studies assessments in Oregon. Bigelow (1999) described how proponents insist that all students benefit from "higher expectations" and greater teacher, principal, and school "accountability" (p. 37). These tests are not only a growing trend but are, becoming a way schools are evaluated by the public. Schools seek to provide meaningful instruction to students that will give them the skills to be successful on these tests. Not only are these test scores important to the evaluation of the local school but also, according to Simmons and Resnick (1993), "performance standards that are being crafted from these tests could reshape the way children learn" (p. 11).

This professional development activity if proven effective will be a model for other high schools to follow when looking to improve scores on the science portion of the GHSGT. Neill (1997) explained how schools can use results of high stakes tests and the supporting professional development to "form a base for a renewed effort to construct additional assessments that support student learning" (p. 58) within the local school.

Research Question

The following research question guided this study:

What impact did the Dacula High School GHSGT Science Professional Development Program have on first-time testing students' scores on the science portion of the GHSGT during the 2001-2002 (experimental group 1) and 2002-2003 (experimental group 2) school year?

Research Hypothesis

There is a statistically significant difference in the adjusted scores on the science portion of the GHSGT, based on the student's eighth grade science ITBS score, of students whose teachers participated in the Dacula High School GHSGT professional development program during the 2001-2002 and 2002-2003 school year and students whose teachers had not participated in the professional development activity (2000-2001 school year).

Definition of Terms

For the purpose of this study, terms were defined as follows:

Dacula High School GHSGT Science Professional Development Program

The Dacula High School GHSGT science professional development program refers to the specific professional development activity developed at Dacula High School, that provided teachers with specific activities to assist student's learning of the academic knowledge and skills contained in the science portion of the GHSGT. This program identified specific test taking strategies as well as content information that students needed to be successful on the test.

Results Based Evaluation System (RBES)

The Results Based Evaluation System is Gwinnett County School System's teacher evaluation system, which is based on achievement data collected within the local school and individually selected goals by each teacher to improve student achievement in their classroom.

Georgia High School Graduation Test (GHSGT)

The Georgia High School Graduation Test is given to all students in their junior year in the State of Georgia in the areas of language arts, mathematics, social studies, and science. For the purpose of this study, scores discussed will be from the science portion of the test.

Local School Plan for Improvement (LSPI)

The Local School Plan for Improvement is developed in conjunction with the Results Based Evaluation System for local schools in Gwinnett County to develop goals for improvement based on data collected through the Results Based Evaluation System.

Limitations of the Study

The study had the following limitations:

1. The professional development treatment was limited to Dacula High School. Differences within the school or in other schools may make this treatment non-transportable, such as other local professional development programs, individual teacher instructional differences, and individual student differences.
2. There could be other factors within individual classrooms that might be contributing to individual student's success or failure on the GHSGT.

3. Generalizations from this study can only be made when comparing schools that are similar to Dacula High School and who implemented the same, or a very similar, professional development program related to scores on the science portion of the GHSGT.

Assumptions of the Study

For the purpose of this study, the following assumption was made:

1. The curriculum and instruction within the school and classrooms evaluated did not change significantly over the three-year study period (2000-2003).

Organization of the Study

Chapter 1 presented the nature of the study being conducted, the need for the study, an overview of the procedures used in the study, the research hypothesis, the limitations of the study, the assumptions of the study, the definitions of terms used in the study, and the organization of the study. The remaining report is organized into four additional chapters. Chapter 2, Review of Literature, is devoted to a review of the literature relating to high-stakes testing, effective professional development procedures, and analyzing scores related to the science portion of the GHSGT. Chapter 3, Design of the Study, describes the research design, the methodology, the sampling procedures, instrumentation, procedure for data collection, and the plan relating to the analysis of the data collected. Chapter 4, Presentation and Analysis of Data, provides a descriptive summary of the subjects in each group, reports the results of the study, and reviews the statistical procedures used to analyze the data findings. Chapter 5, Summary, Conclusions, and Recommendations, provides a summary of the findings, the

conclusions, and the recommendations for future research. This study concludes with a reference listing of all citations and resources used in this study.

CHAPTER 2

REVIEW OF LITERATURE

The idea of creating high stakes tests in order to guide instruction and curriculum is and has been a growing trend in the United States. The National Assessment Governing Board has been tracking trends in state assessments over the last seven years. According to Bond (1995) "southern and southeastern states have the highest number of states requiring graduation tests as validation of achievement in high school" (p.1). Bond also indicated that there is a rapidly growing emphasis on increased student accountability focusing on a final result that improves initial instruction in the classroom. Individual school administrators and teachers must look at the results of the standardized tests and provide staff members and students the necessary resources to be successful on the evaluation. These necessary recourses were apparent to Darling-Hammond and Wise (1985) when they argued that standardized assessments should be "viewed as a means to set more appropriate targets for student, focus professional development efforts for the teachers, encourage curriculum reform, and improve instruction" (p. 315).

Standards Driven Reform

Standards driven reform has been the vehicle used to develop high-stakes standardized tests across the country. There are a variety of views in the research that seek to determine what standards if any need to be used or re-evaluated. According to Chall (2000), "the focus of many of the standards seems to be on the process of learning rather than on what is to be learned" (p. 175). Once the standard is determined, educators

must "have some agreement as to what constitutes enough research evidence on an issue to conclude for or against a practice" (p.182). Educators not only have to use the evidence and research, they must also use it correctly. Chall (2000) recalled, "in various research studies I have been a part of over the past fifty years, I have found that many popular, respected practices were not supported by research" and how "if we are to benefit from educational research, schools of education may have to provide teachers and administrators with a better understanding of educational research" (p. 181).

Standards driven reform uses data to determine where the strengths and weaknesses of a school are located. Schools may use standardized test data as well as locally collected data and individual teacher collected data within the context of action research to improve student learning. According to Calhoun (1994), "analyses of data and their implications for collective action serve as powerful choice points for a school staff, as both noticing choice and doing choice" (p. 89). Action research involves the entire staff of a school collecting data and evaluating it for changes that need to be made. Calhoun (1994) noted that "from the initial collection of baseline data to the regular checks on progress performance during data analysis, the staff faces a series of choice points for unfreezing action and changing the experience of schooling for it's students" (p. 89).

Once the analysis of the data is complete, the staff must determine what direction the school needs to take. This analysis should be a collaborative action that "involves turning the data into information to aid the faculty in making decisions" (p. 88). Data needs to be organized and analyzed on at least three levels: school, grade level, and classroom (p.81). After the organization and analysis of the data schools need to "seek

external sources of information to combine with internal sources as decisions for collective action are made" (p. 88).

Allen and Calhoun (1998) described how action research projects have been implemented and how school system's ability to be responsive and make appropriate changes factored into that process. This research was based on the school's ability to implement and utilize action research. They stated, "action research places disciplined inquiry in the context of focused efforts to improve the quality of the school and its performance" (p. 706). For this type of research to be valid and productive the "improvement lies in the union of the researchers and action takers, for action research is conducted by those persons responsible for bringing about changes" (p. 706). Schmoker (1997) explained the practices and foundational theories that enable schools to develop a results oriented atmosphere. The process is described as the "results cycle, which consists of setting specific targets, teamwork, measurement and feedback, and redefining goals" (p. 5). Additionally, Schmoker discussed how this data collection may "scare many educators initially; however, the use of strategies for reducing the threat of reporting data without eliminating accountability can help reduce the threat" (p. 4). Schmoker discussed the myth of low expectations and explained how to remove the concern that "a focus on results will leave the low-achievers and students from low socioeconomic background behind" (p. 6). Additionally, Sheppard (2003) noted that for a standardized test to be effective, it must not only be aligned with the curriculum but must also cover a wide array of strands and standards across the curriculum including multiple subject areas (p. 55).

Standardized Test History

The assessments themselves are increasingly becoming the focus of much political attention. This "outside pressure" according to Smith and Cohen (1991) "can be ignored or resisted by local educators" (p. 76). Standardized testing is not completely a new idea. According to Resnick "standardized tests in various school subjects were introduced into American schools in the period 1880-1920 when 'outside pressures' combined to encourage the schools to justify their performance in quantitative ways to local taxpayers" (p. 14). This push to increase accountability through an increase in test scores has, according to Jones and Whitford (1997), caused some schools to take "drastic action," by providing that "when the scores exceed the state's expectation for a school, the teachers and administration can receive substantial bonuses" (p. 276).

Sheppard (2003) stated that schools might need to review the history of standardized testing so they can effectively benefit from the lessons learned over time. Accountability reform on any type of large scale implementation came in the 1960s with the beginning of Title I where the federal government provided financial assistance based on test results and numbers of low income students. The tests given in this case were to ensure that the low-income students were receiving a benefit from the increased funding. From that time on, large scale standardized tests have been used to determine program effectiveness and levels of educational achievement. Sheppard (2003) continued the argument by providing that states or local school systems must continually evaluate the validity of the measures and look for the parts of the curriculum that might be missed when only the test results are evaluated (p. 53). Heubert (1999) noted the "use of mandated large-scale testing to evaluate programs has been a part of the public

educational landscape in the United States for more than 30 years" (p.18). As the number of standardized tests increased, the research indicated there were a growing number of theories from educational researchers.

According to Neill (1997) "tests made for such purposes as comparing students to national norms, certifying their accomplishments (or lack thereof), and proving public accountability have come to dominate both public conceptions of assessment and classroom assessment practices" (p. 38). Horn (2003) provided history related to the implementation of standardized testing in the United States with the statement "it was the minimum competency era of the 1970s and early 1980s that ushered in the widespread implementation of (standardized) tests for student-level evaluations". According to Horn (2003), a majority of states use or have plans in place to use state-mandated tests as the sole criterion for graduation from public secondary schools (p. 31). In addition, Horn (2003) argued that as the number of high-stakes tests increases "a growing body of research is attempting to more clearly disentangle the impact of high-stakes exit testing on student drop out rates" (p. 22).

The theories rampant in the research indicate a number of mixed ideas as to how this reform has effected education. For example, according to Smyth and Shacklock (1998), these changes that were occurring worldwide were a part of "global neo-liberal economic and neo-conservative social agendas" and argue that teachers will rise up against the reform in resistance if it were to continue (p. 12). However, extensive studies were not found to verify this specific concept even though it was discussed in some detail.

High-Stakes Description

The most prominent description of a high stakes test found throughout the research appears to lead toward a standardized test that has a graduation or promotion attached to it. Guzenhauser (2003) described "high stakes testing as a method associated with the school accountability movement, which in turn is connected with the standards movement, a related development that has brought together various people who wish to maintain high standards for school curricula and high expectations for the performance of all students" (p. 53). Heubert (1999) offered other descriptions based on the person or entity in the description: "for districts, schools, and/or teachers, high-stakes refers to state-regulated or legislated sanctions of significant consequences such as accreditation, financial rewards, or placing a school in receivership" and "for students, high-stakes refers to state-regulated or legislated sanctions that included the use of test scores to make decisions about grade promotion and/or high school graduation" (p. 25). However, some researchers, e.g., Guzenhauser (2003) discussed the phenomenon of standards based reform in public education and the high stakes testing that resulted from this reform as a "behaviorist, positivist philosophy" that uses quantitative measures as one of the most important indicators of educational success (p. 52).

Reasons for Increased High-Stakes Testing

There are a number of elements that have lead to the increased number of high-stakes standardized tests across the nation. The research available suggested that organizations such as the National Association of Educational Progress, Association for the Development of Supervision and Curriculum Development, as well as state and local organizations along with many federal, state and local legislative mandates have

encouraged improvement in public schools aimed toward raising accountability through standards reform. This reform has resulted in the development of many of the high-stakes standardized tests seen today across the educational landscape. Sheppard (2003) noted that the National Association of Educational Progress has become the "gold standard" in monitoring the achievement trends in education. She argued that to protect the independence of the NAEP, it should be removed from high-stakes uses. The studies of the NAEP along with state and local formal assessments should be, and in many cases are, compared to give an indication of what a single test can and cannot predict (p. 57).

A Nation At Risk, published by The U.S. Department of Education's National Commission on Excellence in Education (1983), gave a jumpstart to the school accountability reform by providing a summary of many of the problems in education at that time. After studying the American education system, the National Commission on Excellence in Education published a federal report entitled *A Nation at Risk* in April 1983. This report claimed that American "students were not studying the right subjects, were not working hard enough, and were not learning enough" (p. 12). This report also warned that "our social structure would crack, our culture erode, our economy totter, and our national defenses weaken" (p.12) unless specific and immediate changes were made in the public education arena. The following quotation provides a sense of where education in the public school systems was going, especially in the area of science:

> If an unfriendly power had attempted to impose on America the mediocre educational performance that exists today, we might well have viewed it as an act of war. As it stands, we have allowed this to happen to ourselves. We have even squandered the gains in achievement made in the wake of the Sputnik challenge. Moreover, we have dismantled essential support systems, which helped make those gains possible. We have, in effect, been

> committing an act of unthinking, unilateral educational disarmament. (p. 5)

The National Commission on Excellence in Education (1983) made the following recommendations:

- Graduation requirements should be strengthened so that all students establish a foundation in five *new* basics: English, mathematics, science, social studies, and computer science. (p. 39)
- Schools and colleges should adopt higher and measurable standards for academic performance. (p.43)
- The amount of time students spend engaged in learning should be significantly increased. (p. 48)
- The teaching profession should be strengthened through higher standards for preparation and professional growth. (p. 52)

The National Commission (1983) also argued there was a "need for student accountability and an increase in the level of demonstrated proficiency" and that "students needed to be held to rigorous and measurable standards in order to ensure the Country's success in the information age" (p. 2). The research in this document is extensive with many critics such as Gordon (2003) who described *A Nation at Risk* as "driven by very narrow economic purposes and a concern for raising test scores" (p. 28). Nevertheless, *A Nation at Risk* boosted the school standards reform and the resulting standardized test revolution.

In 1996 the National Association of Secondary School Principals published the report *Breaking Ranks: Changing an American Institution*. The report sought to provide a definitive study of the "key elements" of reform needed in the nation's secondary schools. The report suggested that "it had not been done in many years and there had been no serious treatment since *A Nation at Risk* was completed in 1983" (p. iv). This report provided many recommendations for schools as they entered the 21st century. One

relevant recommendation provided that "each school would report annually to the community, disclosing school-wide assessment results and other pertinent information" (p. 55). A rationale provided that "while it is important to assess individual students so that their academic progress may be known, it is equally vital to disclose how the school as a whole fares" (p. 56). This report along with *A Nation at Risk* gave specific recommendations that schools should be accountable through standardized test results which resulted in an increase in federal, state, and local legislation.

On January 8, 2002, President Bush signed into law the *No Child Left Behind Act of 2001*. According to the U.S. Department of Education (2003) "the Act is the most sweeping reform of the Elementary and Secondary Education Act (ESEA) since ESEA was enacted in 1965" and seeks to redefine "the federal role in K-12 education to help close the achievement gap between disadvantaged and minority students and their peers" (p. 1). The Act is based on four basic principles: stronger accountability for results, increased flexibility and local control, expanded options for parents, and an emphasis on teaching methods that, according to the U.S. Department of Education (2003), have been proven to work. According to Gulek (2003), the passage of the No Child Left Behind Act provided a "spotlight" on public schools to show accountability and data driven reform. He suggested that this Act called for a "dramatic expansion" of the high-stakes testing at the state level, which resulted in many states mandating high-stakes tests for their schools (p. 42). Gulek (2003) noted how "every state in the U.S. has some form of testing program" when that was not the case prior to the No Child Left Behind Legislation (p. 42). Nevertheless, this legislation, along with additional legislation from state and local agencies, has created a standards driven reform in public education which

resulted in an increase in the quantity on high-stakes standardized tests across the country.

Negative Impacts of Standardized Testing

There are apparent downsides to the high-stakes testing that many schools, districts, and states are moving toward. Neill (1997) argued that the use of such tests means that "some deserving students do not obtain diplomas, in some instances the dropout rate increases, and often schooling is ever more intensively reduced to a test coaching program" (p. 38). Viadero (2001) additionally stated "students in states that require them to pass a test in order to graduate from high school tend to fare worse on the National Assessment of Educational Progress" (p. 32). For example, Viadero (2001) shared the data where "the 17 states with the highest percentages of 8th graders scoring at the proficient level or above on the NAEP mathematics exams in 1996, none required high school graduation tests" (p. 33). However, to accurately account for individual school results, local school analysis of data must be performed.

High-stakes standardized testing can affect students in a variety of ways. Much of the current research indicates that the high-stakes pressures negatively affect some students. Horn (2003) argued, "given the limited nature and the potentially adverse impacts they can have, using state-mandated large-scale testing for student-level high-stakes purposes is unadvisable" (p. 30). She continued this thought process of negative impacts on students with the statement about how "the research shows that the negative impacts of high stakes testing on students are potentially severe" (p. 33). Students' pressures may not be the only negative impact. If the educators narrow the curriculum to provide only the information being tested, students may not receive a comprehensive

amount of content. According to Guzenhauser (2003), "high-stakes testing may lead to a default philosophy of education that holds in high regard a narrow bundle of knowledge and skills" (p. 51). Students may not be provided with a comprehensive curriculum because there is a focus on specific tested content. He noted how "in the context of high-stakes testing, one predominant default philosophy results from an inordinate focus on the tests themselves" which may provide a narrow focus within the approved curriculum (p. 51). Other researchers such as Popham (2002) indicated "today's high-stakes tests, as they are used in most settings, are doing serious educational harm to children" (p. 1). Finally, the negative impacts of high-stakes standardized tests on students have been shown throughout the current research and were verified by Shafer (2001) when he discussed how standardized tests tend to "subvert the desire" to teach to individual students rather than assisting schools more accurately and effectively (p. 16).

Impacts of high-stakes standardized testing reach not only to students but also to the teachers within the local schools. Schlechty (2002) argued "There is no question that the increasing reliance on standardized tests as the sin qua non for measuring the performance of teachers and schools does serve as a source of discouragement for teachers from seriously addressing issues related to ensuring that students are authentically engaged in their schoolwork" (p. 92). The research provided some accountability to the argument that teachers are less satisfied with the teaching content and the motivation in the classroom. Abrams (2003) suggested, "while intending to motivate teachers and students to achieve optimal performance levels, the high-stakes nature of state testing programs can have quite the opposite effect" (p. 19). Abrams additionally described how a teacher's "professionalism in the classroom is a great source

of pride to the individual and the profession of teaching" (p. 19). As the standards reform provided teachers with a prescription for instruction there are inevitably some negative effects. Gordon (2003) stated that "many critics have focused their attention on the issue of testing, charging that the new standardized tests further increase the pressures on teachers to teach to the test" (p. 28) which could sacrifice developing and providing a more complex curriculum for the students and further discourage teachers. Additionally, Guzenhauser (2003) stated that teachers working in the climate of standardized tests many times will end up spending a large amount of instructional time preparing for the tests themselves and de-emphasizing or eliminating much of the untested curriculum materials. He continued his description by stating that "the default philosophy underlying high-stakes testing is a philosophy of education in which tests designed to be part of a system of accountability drive the curriculum, limit instructional innovation, and keep educators from establishing their own priorities and visions" (p. 53).

Positive Impacts of Standardized Testing

Negative impacts of high-stakes standardized testing are noted heavily in the research. However, many positive impacts have been recorded as well. When educators fail to act or react when a problem is detected, the detriments to students could become numerous. Abrams (2003) noted that "central to the current state accountability model is the need for steady increases in test scores as indicators of improved student achievement and, in turn, school effectiveness". Abrams also indicated that the research has shown that "using released items, commercially developed preparation material, and teaching test taking skills can benefit students by familiarizing them with the item format, thus reducing test anxiety and stress" (p. 24). When looking at the benefits of high-stakes

standardized tests, all students from all backgrounds need to be considered. Guzenhauser (2003) noted that the high profile of standardized tests has, in many cases, required educators to give more attention to groups of students who's achievement typically has been overlooked, raise the test scores of many minority groups, thus narrowing the achievement gap, provided additional resources to low performing schools, and has ultimately helped teachers to identify important aspects of the curriculum that they had previously overlooked (p. 55).

School districts, local schools, and individual teachers are noted in the research as recipients of the benefits to high-stakes standardized testing. For example, Abrams (2003) stated how "a growing body of evidence suggests that high-stakes testing can be a driving force behind fundamental changes within a school or system" (p. 18). Additionally, he noted the research as it related to individual teachers by showing how a common finding in the research "is that teachers report giving greater attention to tested content areas" (p. 19). The argument here would be that the teachers are teaching the content on the test. With the standards driven reform in most states and districts, schools are looking to align the teacher's instruction with the curriculum developed in the system. If the standardized test is developed correctly it will provide a clear comprehensive overview of the curriculum content. Abrams (2003) supported this with the argument that state curriculum and assessment standards or frameworks "have the consequence of establishing homogeneity of course content, thereby focusing classroom instruction and providing teachers with a clear purpose" (p. 23). Additionally, Sheppard (2003) reiterated this point when she stated how the research has indicated over the past ten years that teachers became engaged in the "real curriculum" only after the high-stakes

tests were implemented (p. 54). Finally, Popham (2001) noted the importance of educational testing as it related to teaching in general. He discussed the basic point that teachers needed an avenue to align the curriculum with while "directing their instruction toward tangible teaching targets" (p. 16).

Other Effects of Standardized Testing

There are many other effects of standardized high-stakes testing as it relates to education in general. When determining the potential effects of the test, researchers must identify specific tests and the impacts they have on specific students. According to Horn, (2003) "as state-mandated standardized testing becomes an increasingly popular tool by which to make student-level high-stakes decisions such as promotion or graduation from high school, it is critical to look at such applications and their effects on students" (p. 30). The research indicated the tests could be invaluable to educators if they used the correct analysis and data collection. Horn (2003) supported this point when she noted how "test scores give up important information, but they do not give us all the information necessary to make critical decisions" (p. 30). The research overwhelmingly emphasized how educators needed to use a variety of data when making decisions about students. Some research indicated the need for more tests, where other research indicated the need for student interactive measures such as mentors and portfolios.

As education becomes more global, students are required to gain an increasing amount of knowledge in many areas. Districts, local schools, and individual teachers are affected by the pressures of increased information to present to the students without an increase in the time allotted. According to Abrams (2003), "teachers frequently report that the pressure to raise test scores encourages them to emphasize instructional and

assessment strategies that mirror the content and format of the state test, and to devote large amounts of classroom time to test preparation activities" (p. 18). With an increase in the amount of time spent on test taking strategies, which has been shown to effectively increase test scores, there will inevitably be a decrease in the amount of time available for content. Abrams (2003) supported this when he stated, "the majority of research on state testing programs has focused on the effects on classroom practices and has reported on changes in the focus, content, and pedagogy of instruction" (p. 21). Along with the time constraints educators have, they must determine that the content being provided to the students is comprehensive. Abrams (2003) continued this thought with the statement that "the curriculum standards or frameworks established by states are intended to articulate high expectations for academic achievement and clear outcomes for students" (p. 23).

Finally, as education shifts toward accountability and standards driven reform, additional pressure will be on the local schools to develop a sense of community. The educational experience each student receives cannot be overlooked or overshadowed by standards and high-stakes testing. Continual improvement and accountability will need to be worked into the educational environment while still providing for the experience. Eisner (2002) argued that as schools rush toward the accountability reform, very little emphasis is placed on the philosophy that the educational community should embrace. Instead, he stated that the value of education should be the subject of educational discussions in place of the standardized test revolution (p. 577).

School/District Incentives

As the nation, state, and local schools move toward accountability through high-stakes testing, there will continue to be incentives, perceived or otherwise earned by high

achieving schools. The research indicated both positive and negative impacts as it relates to incentives for achievement on standardized tests. Systems need to be ever mindful of placing blame before all factors have been considered. Gordon (2003) argued "teachers are usually the first to be singled out for reproach when students perform poorly on standardized tests, as though classroom size, outdated curricula, and the physical conditions of the school, to mention only a few factors, have nothing to do with student learning" (p. 31). Teachers are not the only ones evaluated on local school performance on standardized tests. State and local school districts are beginning to evaluate program effectiveness by the performance of individual schools compared to that of other similar communities. To that end, Abrams (2003) stated how "not only do the results of state tests provide information about the progress of individual students, the results are often aggregated to evaluate school and/or district performance". He also noted "in 2001, 18 states rewarded schools with financial incentives for high or improved test scores, and at least 20 attached sanctions for schools due to poor student performance on the state test" (p. 21). Incentives, or in some cases disincentives, according to the research can provide positive and negative effects on school and district performance on standardized tests. According to Abrams (2003), in some cases when schools showed a lack of performance on the state test "they may face losing funding or could in some cases be taken over by the state". However, the main focus of the debate surrounding state testing programs centers on the "severity of the sanctions attached to the test results and whether indicators in addition to test results should be used to hold educators and/or students accountable" (p. 21). When determining the effectiveness of incentives placed on standardized test

results, the research indicated that many factors needed to be considered including the effect on student performance, teacher motivation, and community support.

Brief Science Education History

Science education in public schools was fairly non-existent until the early years of the twentieth century. Dewy (1910) discussed science as inquiry and made an argument for developing a curriculum, which included scientific thinking, measurement, and inquiry. According to Victor and Kellough (1993), the publication of the National Society for the Study of Education's Thirty-First Yearbook spurred an interest in science education at all levels, including elementary (p. 6). From this time forward it was assumed that most school systems maintained a science curriculum from elementary school through high school. It was not until 1957, when the Soviet Union launched Sputnik, the first orbiting space satellite, that America became concerned with the presence of a comprehensive and increasing science curriculum (p. 8). From the 1960s on, there has been a push for America to become a leader in the development of scientific thinkers. Surprisingly however, the standards in science education have increased but the number of high-stakes tests in the area of science has remained relatively low.

The same argument about the U.S. lagging behind other countries plagued the research. According to Chall (2000) "science educators are calling for a return to a greater emphasis on content – specifically, more challenging content" (p. 74). Based on research collected by Chall (2000), there has been an "an outcry for professional competency that became particularly strong when U.S. students were found to lag significantly behind European and Asian students on international tests of scientific knowledge" (p.75). Not only is there a push for higher scores on standardized tests but

also “high schools have been encouraging all students to take more courses in mathematics, science, and foreign language – the traditional harder courses” (p. 173). Rowe argued that a problem of the 1990’s was the “comparatively poor performance of U.S. students at the fifth grade level and all grade levels beyond the fifth on the Second International Science Study (SISS 1988) of the International Association for the Evaluation of Educational Achievement” (p. 1174). Moreover, he argued that diverse ethnic groups “have not been major participants in science programs, and efforts to bring them fully into a science and mathematics curriculum has not been an important goal of elementary or secondary schools” (p. 1172) which may contribute to the overall difficulty in increasing standardized test scores in the area of science.

Science Standardized Testing

With the push for accountability and standardized testing in most academic areas, science continues to elude the standardized tests in many areas. According to Adams, (2003) “with the emphasis on standardized testing in many schools, science is placed on the back burner, because it is often not a tested subject” (p. 116). Another argument for the lack of science content area standardized tests lies within the content of the curriculum itself. Guzenhauser (2003) argued that standardized testing would not effectively measure the complexity in the curriculum within the scientific curricula. He developed an argument that while there are many specifics that can be measured such as the freezing point of water, test scores are not so reliable. His account of this phenomenon suggested that the faith that many educators place on the scoring of standardized tests is a misguided accountability measure that “even psychometricians and statisticians do not have (p. 54).

According to Finneran (2002), it is apparent in the case of science standardized testing that the majority of discussion needs to focus on how to "gain a better understanding of how well young people are learning and how to gain insights into what can be done to enhance their education" (p. 43). Science curriculum is largely based on laboratory or hands-on activities, which in many cases are difficult to assess. However, according to Victor and Kellough (1993), there is discussion in the educational community about not only expanding the standardized testing in science but also developing a national curriculum which could be accompanied by a national test to help create alignment with all school systems (p. 239). They additionally stated, "since 1969, through the Educational Testing Service, The National Assessment of Educational Progress has been conducting regular surveys of student proficiency in science" (p. 239). The research continued to point toward the need to increased testing in the area of science; however, the debate appeared to be hinging on how the tests should be constructed.

Georgia High School Graduation Test

According to the Gwinnett County Board of Education (1996), the Gwinnett County Public Schools implemented the statewide testing program as approved by the Georgia Board of Education, which included the Georgia High School Graduation Test (GHSGT). The GHSGT requires all students to pass a test in each of the four areas: language arts, mathematics, social studies, and science. Students who fail to pass any portion of the Graduation Test are not eligible for a diploma in the State of Georgia until they successfully take and pass each portion of the test. The Georgia Department of Education reports the results of this test along with the results of other standardized tests

such as the Tests of Achievement and Proficiency (TAP) and the Scholastic Assessment Test (SAT) in the Georgia Public Education Report Card along with other information such as drop out rate and free and reduced student rates. According to Weller and Weller (1998), other "test-performance" pressures on students in Georgia "include the University System of Georgia's new guidelines for entrance into a Georgia institution of higher learning, which focuses on SAT or ACT scores, and the state school superintendent's plan to develop subject area exit tests for core high school subjects" (p. 160). However, with the 2003 election of a new state superintendent, the exit test development is somewhat unknown. Weller and Weller (1998) described how school systems, concerned that test scores were going to be used to evaluate specific schools, developed a plan that "called for not only a systematic attack on the barriers believed to be inhibiting student outcomes on tests, but a sustained focus on the total high school program and its curriculum with the goal of long term improvement in the process of student learning" (p. 161). These authors described a method employed at Winder-Barrow High School that used a continuous improvement framework and targeted raising test scores on standardized tests. The continuous improvement concept involved three phases: "(1) stabilizing the process by identifying and eradicating problems that are prohibiting the process from functioning like it should, (2) making active improvements in the process, and (3) monitoring and maintaining the process through continual improvement" (p. 161). The outcome of the framework enacted, resulted in a significant increase in test scores and many other unmeasured favorable outcomes such as teacher pride and satisfaction (p. 165).

Score Disparity

There are some disagreements in the research regarding what score or amount of knowledge on a standardized test is sufficient to achieve a passing score. In the field of science, according to Veronesi (2000), many "states have been pushing for high stakes, cheaper, standardized tests that attempt to measure student learning outcomes or program effectiveness for purposes of program accountability". He continued by arguing that because of the performance aspect of the science curriculum it is not only difficult to develop an effective test, but also it is even more arbitrary to assign a score that will effectively measure the amount of knowledge the student has retained (p. 28). Additionally, Fielder (2003) argued that when looking at standardized test assessments, "it is not the test score itself that is so important; rather, it is the value the school/district is adding to student learning" (p. 105). Unfortunately, much of the data is misused when the public is given test scores by rank from the media. Fielder (2003) added, "in many instances, schools that have high test scores are actually adding less value to the educational experience than schools with lower test scores" because they are only focused on the standards in the assessment (p. 105). Moreover, according to Finneran (2002), many teachers "worry that the focus on a single test", such as the science portion of the graduation test, "will narrow the curriculum and lead teachers to emphasize test-taking skills at the expense of more important matters such as writing", and in the case of the science curriculum, "problem solving" skills (p. 42). Standardized test scores in schools are many times compared to profit loss statements in corporations. Schlechty (2002), provided an argument that "an over attention to short-term gains can lead to bad decisions and eventually to the destruction of the enterprise" (p. 93). Similarly, Kanter

(1997) described "the fact that money can be counted (just as test scores) means that financial measures can swap other measures of performance and value and claim disproportionate time and attention – even when counting (or test measurement) is suspect" (p. 278).

The research indicated that certain activities by educators lead to invalid test scores even when the test is deemed a valid measure. According to Abrams (2003) "specific test preparation activities, coaching, and instruction geared toward the test can yield scores that are invalid" (p. 19). This argument is based on the educators presenting students with a majority of the test format and content. If the test development was comprehensive, then the research indicated that this type of activity would be unlikely. Finally, science standardized test scores can only present educators with information based on the quality of the assessment instrument. Sheppard (2003) verified this when she argued how the resulting pass or fail score only needs to provide the educators and the public with an accurate, comparative picture of the academic achievement of the students within the system. Moreover, states need to be cognizant of the fact that if the tests are made too easy or simple, the results will only convey an "inflated sense" of student achievement within the state (p. 57).

Standardized Test Preparation

According to Guzenhauser (2003), educators should look into following these recommendations when implementing a standards driven reform for their school: maintain dialogue between students, teachers, administrators and the educational community; expand internal accountability while engaging high standards; continually provide higher order concepts to the students; provide funding to support goals of the

school and not the scores on the standardized tests; and develop alternative goals while taking community responsibility for all schools (p. 57). Research in the area of high-stakes test preparation for students such as that of Norton and Park (1996) and Chittoran and Miles (2001) found a significant relationship between student test preparation and the student's academic performance on the high-stakes test. Gulek stated how "adequate and appropriate test preparation plays an important role in helping students demonstrate their knowledge and skills in high-stakes testing situations" (p. 43). Gulek noted Miyasaka (2000) who identified five types of test preparation practices that help students show their knowledge and skills on high-stakes tests. The identified practices were as follows: "(a) teaching the content domain, (b) using a variety of assessment approaches and formats, (c) teaching time management skills, (d) fostering student motivation, and (e) reducing test anxiety" (p. 43).

Data Disaggregation

Data are useful when the measures they were taken from are valid and reliable, and the analysis is comprehensive and correct. If only pass/fail scores are collected and no intermediate analysis is conducted, educators lose much of the usefulness from the standardized test. Calhoun (1994) argued that "data need to be organized so it can be determined if there are group differences among learners in the school – such as differences in success rates between girls and boys, and among various ethnic groups and among socioeconomic levels". The disaggregation of the data can "help faculty members identify problems and provide them with information that guides action" (p. 72). Additionally, Calhoun suggested how the disaggregation of the data provides an

organization "so that the clearest and richest picture of the area of interest or initiative is communicated to the faculty" (p. 71).

According to the research, most standards based data driven school reform measures have some form of data disaggregation. For example, according to Davenport (2002) "data disaggregation - defined as dividing the data into its constituent parts – is the critical first step of the Plan-Do-Check-Act Instructional Cycle" (p. 61). When the data are collected and organized they must be presented to all individuals involved to achieve the most effective results. Davenport (2002) noted how data disaggregation "allows administrators and teachers to base their planning and instructional decisions on fact, diagnose problems, and work together to close gaps in student achievement" (p. 61).

Professional Development Related to Standardized Testing

Teachers in the local school are the front line staff members most likely to have an impact on the student achievement and standardized test scores. Throughout the research, it is evident that funding and time must be devoted to the continuous development of the teachers. Guzenhauser (2003) argued that when providing professional development to the teachers in their school, principals should take a stance to protect students from the negative impacts of standardized high-stakes testing and additionally should maintain the school's philosophy of educating students by discouraging methods that only strive to increase scores on these tests (p. 56).

Teachers and administrators in the local schools need to be provided the information and tools necessary to evaluate and analyze the test data. Once the local schools have a plan in place to evaluate the data and make operational and strategic changes necessary to achieve results, the test measures will become more effective.

According to Fullan (1982), "strategic and operational practices in any school system must place the majority of its focus on one particular outcome, student achievement" (p.4). With this in mind, schools will be forced to implement professional development initiatives that promote increased student achievement on the tests with which they are evaluated. Schlechty (2002) stated, "equally important to test scores is the quality of plans for addressing issues that come up when test scores indicate that there is a problem" (p. 93). The professional development opportunities for teachers and administrators should be focused on the specific areas they teach, as well as, the deficient areas found from the disaggregated data.

Effective teacher development within the schools can become a source of not only teacher collaboration but also, an increase in student achievement and standardized test scores. It is apparent in the literature that teacher collaboration and team planning based on test scores can be an effective development tool. Neill (1997) described how using test related data along with teacher collaboration about the scores "helps teachers improve their practice and simultaneously works to improve their schools" (p. 38). Teams should be developed within a school to determine the strength and weakness in specific content areas. Teachers with expertise in certain areas should be used for their knowledge of subject and content material. According to Schlechty (2002), the principal should "encourage the faculty to work together to create a solution to the problems identified" as well as possibly holding "a one- or two-day faculty retreat" (p. 33). The purpose of the principal and other support administrators should be to provide the staff with the necessary tools to enhance the school's effectiveness. Schlechty (2002) stated, "the primary function of a leader is to inspire others to do things they might otherwise not

do and encourage others to go in directions they might not otherwise pursue" (p. xx). The administrative staff should be a source of support and inspiration toward a common goal and provide teachers a chance to lead others in pursuit of a common goal. Schlechty (2002) argued, "as leaders, great teachers understand that the needs and interests of those they want to follow them" (p. xviii).

Allen and Calhoun (1998) described a substantial increase in the "ongoing opportunities for everyone involved reflecting together about the underpinnings of action research" (p. 709). Additionally "the content of professional development" was described as needing to be focused on a "more supportive, nurturing community" (p. 709). There also needed to be an effort on the part of the facilitators and organizers to "recognize that the process must be relevant to the individual questions and classroom needs of teachers if they are expected to take part" (p. 710). They concluded that the "time for collaborative work and the support of others are essential to successful school-wide action research" (p. 710).

Conclusion

Many changes have taken place in public education over the past hundred years. More recently, there has been a significant increase in the search for accountability within the local, state, and federal educational policies and procedures. With the educational changes in recent years, based on a standards-driven reform model, there has been an increase in the use and reporting of high stakes standardized testing of students in all public schools. The research indicated that there are numerous positive and negative aspects of high stakes testing ranging from an alignment of the curriculum to teachers losing sight of the curriculum to teach the test. These positive and negative impacts have

had a significant effect on changes in the public educational arena. In some instances there are incentives for schools or districts if, or when, they increase test scores. This chapter provided an analysis of science standardized testing and the impact of the GHSGT. The research indicated that there could be a problem with score disparity among some schools and districts. Finally, the research has shown a need for reliable and valid standardized tests for students as well as comprehensive professional development related to these tests for the teachers that will provide the students with the skills and content necessary to be successful on standardized tests.

Chapter 3 will specify the research design and methodology of the research study conducted. The null hypothesis will be presented along with the variables and treatment of the study. The data collection, instrumentation, and statistical treatment will also be discussed.

CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

Chapter 3 contains a description of the research design, methodology, the sampling procedures, the procedure for data collection, the plan for analysis of the data collected, and the professional development treatment provided to teachers at Dacula High School. This ex-post facto study was conducted to determine if the Dacula GHSGT science professional development program was effective in increasing student scores on the science portion of the GHSGT. Dacula High School implemented specific strategies for improving scores on the science portion of the GHSGT, beginning with the 2001-2002 school year. Dacula High School's Local School Plan for Improvement, starting with the 2001-2002 school year, specifically provided for a professional development program to help teachers implement strategies that would provide students additional support in the area of science. The results of this study will be helpful in developing future professional development programs at Dacula High School as well as other public high schools in Gwinnett County as well as throughout the Sate of Georgia.

Research Question

What impact did the Dacula High School science GHSGT professional development program have on first-time testing students' scores on the science portion of the GHSGT during the 2001-2002 and 2002-2003 school years?

Null Hypothesis

There is no statistically significant difference in the adjusted mean scores, based on the student's eighth grade ITBS (covariate) scores, on the science portion of the GHSGT of students whose teachers participated in the Dacula GHSGT professional development during the 2001-2002 and 2002-2003 school years and students whose teachers had not participated in the professional development activity.

Population and Samples

This study was comprised of all regular education students who were in their junior year at Dacula High School and who were taking the GHSGT for the first time. The samples were two groups of students whose teachers participated in the professional development program at Dacula High School and a control group of students whose teachers had not participated in the professional development program at Dacula High School. All the students selected had completed the 10^{th} grade and taken the GHSGT for the first time. The control group was comprised of first time test takers during the 2000-2001 school year whose teachers had not participated in the GHSGT science professional development program. During the 2000-2001 school year no specific professional development activities were conducted that were focused on improving science scores on the GHSGT. The two experimental samples were first time GHSGT test takers during the 2001-2002 (experimental group 1) and 2002-2003 (experimental group 2) school years. These two years were comprised of students whose teachers had participated in the experimental professional development activities aimed at increasing science scores on the GHSGT.

Methodology

The complete science GHSGT professional development program was administered to all science teachers in the 2001-2002 school year. During the 2002-2003 school year teachers who were involved in the prior year training only participated in the 10 one-hour sessions, however any teacher new to Dacula High School participated in the complete program. This results were enhancements of instruction in the way teachers provided science instruction targeted toward student preparation for the GHSGT for years 2001-2002 and 2002-2003. The control group was comprised of students who were first time test takers, during the 2000-2001 school year, as there was no teacher professional development directed toward improving scores on the GHSGT. All the student's scores on the GHSGT were adjusted using a covariate achievement score, based on their eighth grade science ITBS score, to statistically equate the groups.

Dependent Variable

The dependent variable for this study was the student's first time attempt science score on the GHSGT.

Independent Variable

The independent variable for this study was the professional development treatment groups to which the student's teachers were involved. There were three groups in this study. Two experimental groups comprised of students who participated as first time test takers in the science portion of the GHSGT and had science teachers involved in the professional development activities during the 2001-2002 and 2002-2003 school year. The control group was comprised of students who participated as first time test takers in the science portion of the GHSGT during the 2000-2001 school year and whose teachers

did not participate in any professional development program geared toward increasing scores on the science portion of the GHSGT.

Science GHSGT Professional Development Treatment

The professional development activities consisted of two full day sessions (8 hours) during contract time and 10 one-hour sessions throughout the school year for teachers to work together on strategies to increase student achievement on standardized high-stakes tests, specifically the GHSGT. The professional development program was approved by Gwinnett County Public Schools through the local school professional development proposal form (Appendix D). These release days provided the teachers with an overview of the test, scoring techniques, knowledge, and process skills (Appendix E). Teachers were given specific activities to implement in their classes and time to observe and coach other teachers in similar activities.

The professional development activities and programs were developed for the science teachers at Dacula High School. The activities were implemented in the science classrooms at Dacula High School during and after the professional development program. The program was based on the following areas:

- Teaching science content that aligned the Gwinnett County Public Schools curriculum with the science content found on standardized tests such as the GHSGT.
- Teaching test taking skills to the students and applying similar type test questions to the assessments provided in science courses.
- Simulation activities provided to the students that provide practice tests similar to the GHSGT.

- Providing students and teachers reliable information regarding the use and importance of the data collected by standardized tests.
- Discussion and mentoring for the science teachers throughout the program.

The first release day was held at one of the county office meeting rooms away from the school. A room was secured at Lawrenceville East, a Gwinnett County Public School System building used for professional development. The hours were from 7:00 a.m.-3:00 p.m. with a one-hour lunch break from 11:30 a.m. to 12:30 p.m. Two teachers from Dacula High School facilitated the activities for the day. The teachers facilitating the professional development activity were both veteran science teachers, each with more that 10 years of experience in the science classroom.

The day was divided into multiple components including communication, knowledge, processes, and teaching methods. The first activity was an icebreaker activity in which the teachers discussed test preparation in their individual classrooms. Special emphasis was placed on specific activities that related to standardized tests. The group leaders used the review text by Wesselman (2000), *Passing the Science Graduation Test* to discuss formal and informal science communication. They used the prepared overheads from the handbook to show relevant science knowledge and processes that would be found on the test. An overview of all knowledge and skills needed to be successful on the test were provided to the participants.

These activities transitioned into what changes in the standardized testing procedures were being made within Gwinnett County Public Schools. The Director of Science Education for Gwinnett County provided the group with remarks on how the Georgia Department of Education views standardized testing and possible ramifications

for the future, including the possibility of end of course exams, which were slated to replace the GHSGT some time in the future. The Director of Assessment for Gwinnett County Public Schools then provided remarks to the group related to standardized testing in the county. She discussed the strategic goals of the county that related to increasing standardized test scores and how teachers should employ strategies to help support those goals.

After lunch, the group viewed a video titled "Who Moved My Cheese?" The video is about change and how individuals should view change as an integral way to grow and learn. The group leaders facilitated a discussion on change and ways teachers can spearhead change within the local school. This was the first teacher lead professional development of this magnitude for Dacula High School.

The remainder of the day was spent in small groups where the teachers worked on individual projects to implement in their classrooms. Teachers were asked to set specific days to work on standardized test activities and select two days to observe two separate teachers implementing their activities within their classrooms. Teachers were asked to provide peer feedback within one day of the observation to the science teacher they observed.

The second release day was held at the same remote location away from the school and used the same hours and lunch break. The same two teachers facilitated the activities for the day. The group leaders directed the group in a discussion of the activities each teacher used and any positive or negative feedback from students or observing teachers. Teachers were provided with an overview of the computer software that was purchased by Gwinnett County Public School System to help prepare students to

take the GHSGT. This software "Pre-Georgia High School Graduation Test Simulation" was available for teachers to provide for their classes in a computer lab. The teachers worked with the software for the next two and one-half hours. After lunch the teachers worked in their small groups to develop individual activities to provide students in their classrooms.

Along with these two release days, the teachers were required to attend 10 one-hour professional development activities held once per month after school. Each teacher in the science department was given a day to present material to the other teachers. This information related to current trends in science education that was identified by members of the department as important as it related to science standardized testing. The material presented in the one hour sessions included technology in the science classroom, Biology standard knowledge, Chemistry standard knowledge, Physics standard knowledge, GHSGT Score results and analysis, scientific graphing, standard math concepts in science classes, review of data acquisition software, academic knowledge and skills required in each core science subject, and lab writing standards.

This format was used for both experimental groups. Teachers receiving the professional development in the first year were only required to attend the 10 one-hour meetings the second year and were required to maintain at least two peer observations during an eligible lesson (one that involved processes that would help students succeed on a standardized test).

The teachers were required to complete the Gwinnett County Professional Development Pre-Advisement Form (Appendix C) to received 2 staff development units for the 2 release days and 1 staff development unit for the 10 one-hour meetings. The

staff development units (SDU's) were eligible to be used by each teacher toward re-certification in the State of Georgia. The contact time for each activity (30 hours total) was eligible to be used by the teachers for the mandatory 20 hours required by Dacula High School.

Data Collection

All data were collected from existing records from Dacula High School in Gwinnett County, Georgia. The dependent variable was the adjusted science scores on the GHSGT, based on the student's science ITBS score, while the independent variable was the group to which the student belonged. The control group data were collected from the local school records based on the scores the students received in the 2000-2001 school year. The two experimental groups records were collected from existing local school data based on the year the students participated as first time test takers on the GHSGT during the 2001-2002 and 2002-2003 school years. In all groups the students were in their junior year of high school and were taking the GHSGT for the first time. All the students' scores were adjusted by the covariate (ITBS Science achievement results) to statistically equate the groups.

Instrumentation

This ex-post facto type study described by Campbell and Stanley (1963) collected existing data from academic reports and individual student testing results on file at Dacula High School located in Gwinnett County, Georgia. Academic and standardized test result reports produced by the State of Georgia and Gwinnett County Central Office personnel were used. These reports produced numerical scores from the science portion

of the GHSGT and the achievement score from the science portion of the ITBS as well as student ethnicity, gender, and free or reduced lunch status.

Statistical Treatment

Quantitative methods were used in this study to analyze the student scores and compare the differences between the groups. The statistical procedure be applied in this study was a multi-sample pretest-posttest design with the pretest as a covariate and the posttest scores adjusted based on it's co-variation with the pretest data. This analysis of covariance (ANCOVA) was used to adjust the variation of the scores based on achievement covariate selected. In this statistical treatment the covariate used was the student's ITBS science standard scaled score, an achievement measure that was related to the dependent variable, which was the student's standard scaled score on the science portion of the GHSGT. The independent variable for this study was the group to which the students belonged. The Statistical Procedure for Social Sciences (SPSS 11.0.1) was used to obtain descriptive measures.

Analysis of Data

Descriptive statistics were used in this study to determine the sample adjusted means and standard deviation. The statistical procedure used the analysis of covariance (ANCOVA) to test the hypothesis at the .05 alpha level of significance based on the abundance of educational research and the confidence of the researcher in rejecting the null hypothesis or avoiding a Type I error. This significance was also determined based on the large sample size used and the reduced threat of obtaining a Type II error.

Conclusion

The research design was an ex-post facto study using the analysis of covariance as that statistical procedure to determine if the Dacula GHSGT science professional development program was effective in increasing student scores on the science portion of the GHSGT based on adjustments made by the science ITBS score (covariate). Chapter Three described the procedures and methods that were used by the researcher in this study. This description included details about the subjects in the sample population and the statistical treatment used in analyzing the data. This information was the basis in determining if the null hypothesis was accepted or rejected in this study.

Chapter Four contains an analysis of the data. This analysis will include a summary of the sample population, a report of the results of the tests used in this study, and a review of the statistical procedures used to analyze the findings.

CHAPTER 4

PRESENTATION AND ANALYSIS OF DATA

The purpose of this study was to determine the effectiveness of the GHSGT Science Professional Development Program as it related to Dacula High School's student scores on the science portion of the GHSGT over a two-year period (2001-2002 and 2002-2003 school years). Dacula High School implemented specific strategies for improving scores on the science portion of the GHSGT beginning with the 2001–2002 school year and continuing for future years based on the program effectiveness. Dacula High School's Local School Plan of Improvement starting with the 2001–2002 school year specifically provided a professional development program to help teachers implement strategies that would provide students additional support in the area of science. This chapter provides a description of the sample used in the study as well as the descriptive and inferential statistics.

Description of Sample

This study was comprised of all the regular education students who were in their junior year at Dacula High School and who were taking the GHSGT for the first time. The two experimental samples were first time GHSGT test takers during the 2001-2002 (Experimental Group 1) and 2002-2003 (Experimental Group 2) school years. These two years were comprised of students whose teachers had participated in the experimental professional development activities aimed at increasing science scores on the GHSGT. The control group was comprised of first time test takers during the 2000-2001 school

year whose teachers had not participated in the GHSGT science professional development program. During this school year no specific professional development activities were conducted that were focused on improving science scores on the GHSGT. The description of the groups used in this study is presented in Table 1. The demographic data are presented as follows: gender of participants in Table 2, ethnicity of participants in Table 3, and socioeconomic level of participants based on free/reduced lunch status in Table 4. The data were disaggregated by student gender, ethnicity, and income level (free reduced lunch statistics to indicate low socioeconomic status).

The study was comprised of all regular education students at Dacula High School who were in their junior year and who were taking the GHSGT for the first time. The standard scaled score was used for the ITBS (covariate) and the GHSGT for all the students in this study. There were a total of 1205 students in the study of which 623 were female and 582 were male. The control group contained 275, experimental group 1 contained 315, and experimental group 2 contained 615. The ethnic breakdown was as follows: 1095 white, 50 African American, 24 Hispanic, 31 Asian, 5 Multiracial. There were 94 students who were classified as receiving free and/or reduced lunch. The control group (2000-2001) contained 275 students of which 142 were female and 133 were male. The ethnic breakdown was as follows: 248 White, 15 African American, 4 Hispanic, 6 Asian, and 2 Multiracial. There were 21 students who were classified as receiving free and/or reduced lunch. The experimental group 1 (2001-2002) contained 315 students of which 172 were female and 143 were male. The ethnic breakdown was as follows: 288 White, 17 African American, 5 Hispanic, 5 Asian, 0 Multiracial. There were 29 students who were classified as low socioeconomic based on receiving free and/or reduced lunch.

Table 1

Description of Study Groups

School Year	Group Designation	N
2000-2001	Control Group	275
2001-2002	Experimental Group 1	315
2002-2003	Experimental Group 2	615

Table 2

Gender of Participants

School Year	Female		Male	
	N	%	N	%
Control (2000-2001)	142	52	133	48
Exp. 1 (2001-2002)	172	55	143	45
Exp. 2 (2002-2003)	309	50	306	50
Total	623	52	582	48

Table 3

Ethnicity of Participants

Ethnicity	Control		Exp. 1		Exp. 2		Total	
	N	%	N	%	N	%	N	%
White	248	90	288	91	559	91	1095	91
African American	15	6	17	5	18	3	50	4
Hispanic	4	1	5	2	15	2	24	2
Asian	6	2	5	2	20	4	31	3
Multiracial	2	1	0	0	3	1	5	<1

Table 4

Socioeconomic Level of Participants

School Year	Free/Reduced Students	
	N	%
Control (2000-2001)	21	7.6
Exp. 1 (2001-2002)	29	9.2
Exp. 2 (2002-2003)	44	7.2
Total	94	7.8

The experimental group 2 (2002-2003) contained 615 students of which 309 were female, and 306 were male. The ethnic breakdown was as follows: 559 white, 18 African American, 15 Hispanic, 20 Asian, 3 Multiracial. There were 44 students who were classified as receiving free and/or reduced lunch.

Descriptive and Inferential Statistics

This section provides information pertaining to descriptive and inferential statistics for the dependent variable. All tests of significance were based on the .05 alpha level of significance. Based on the findings and within the limitations of this study, the null hypothesis tested was as follows: There was no statistically significant difference in the adjusted mean scores on the science portion of the GHSGT of students whose teachers participated in the Dacula GHSGT professional development and students whose teachers had not participated in the professional development activity.

The research design was an ex-post facto study using analysis of covariance as the statistical procedure to determine if the Dacula GHSGT science professional development program was effective in increasing student scores on the science portion of the GHSGT. An analysis of covariance was used to reduce the variation of the scores based on multiple years of student data used. In this statistical treatment the covariate used was the student's ITBS science score (eighth grade), which was an achievement measure that was related to the dependent variable, which was the student's score on the science portion of the GHSGT. The independent variable for this study was the group to which the students belonged. The GHSGT scaled score adjusted means increased each year with the control group's adjusted mean at 510.14. This score changed to 514.34

with experimental group 1 and to 519.26 with experimental group 2. The data are presented in Table 5 and shown graphically in Figure 1.

The following analysis was made using SPSS 11.0.1. The results between the covariate and the group treatment levels are shown in Table 6. According to the statistical data found in Table 6, the ITBS (covariate) was significantly related to the posttest (GHSGT) given $F_{1,\ 1201} = .304.25$, p # .000. Based on the data in Table 6 there is significant statistical evidence at the .05 level of significance that the professional development treatment was effective toward increasing scores on the science portion of the GHSGT given $F_{2,\ 1201} = 47.95$, p # .000.

On January 8, 2002, President Bush signed into law the *No Child Left Behind Act of 2001*. According to the U.S. Department of Education (2003) "the Act is the most sweeping reform of the Elementary and Secondary Education Act (ESEA) since ESEA was enacted in 1965" and seeks to redefine "the federal role in K-12 education to help close the achievement gap between disadvantaged and minority students and their peers" (p. 1). The Act is based on four basic principles: stronger accountability for results, increased flexibility and local control, expanded options for parents, and an emphasis on teaching methods that, according to the U.S. Department of Education (2003), have been proven to work. The NCLB Act seeks to strengthen Title I accountability by requiring States to implement statewide accountability systems covering all public schools and students. These systems are based on standards in reading and mathematics, annual testing for all students in grades three through eight, and annual statewide progress objectives ensuring that all groups of students reach proficiency within twelve years. According to the Department of Education (2003) "assessment results and State progress

objectives must be broken out by poverty, race, ethnicity, disability, and limited English proficiency to ensure that no group is left behind" (p. 1). Schools that fail to make adequate yearly progress (AYP) toward it's states proficiency goals are subject to changes in improvement methods, possible corrective action, and restructuring measures that are aimed at meeting State standards.

Because of the legislation requiring Public Schools to disaggregate their data, this study provided a post hoc analysis of the data similar to the requirements by the No Child Left Behind Act. This post hoc analysis disaggregated the data based on the gender, ethnicity, and socioeconomic level of the participants. Students with disabilities and/or limited language proficiency were not included in this study. An analysis of covariance (ANCOVA) was performed to determine significant differences between and among these specific groups. The means and standard deviations of each group are presented as well as the adjusted means, based on the student's eighth grade science ITBS scores, and the standard error.

The data were disaggregated based on the gender of the participants. The means, standard deviations, and number of participants in each subgroup are presented in Table 7. The means are presented graphically by gender in Figure 2. The means of each group (female and male) increased each year the treatments were performed. The female students' mean score for the control group was 508.6 and changed to 511.9 with experimental group 1, and to 516.4 with experimental group 2. The male students' mean score for the control group was 512.1 and changed to 518.7 with experimental group 1, and to 521.4 with experimental group 2.

Table 5

Dependent Variable: (GHSGT) Scaled Score Means

School Year	Adjusted Means	Std. Error
Control (2000-2001)	510.14	.798
Exp. 1 (2001-2002)	514.34	.747
Exp. 2 (2002-2003)	519.26	.534

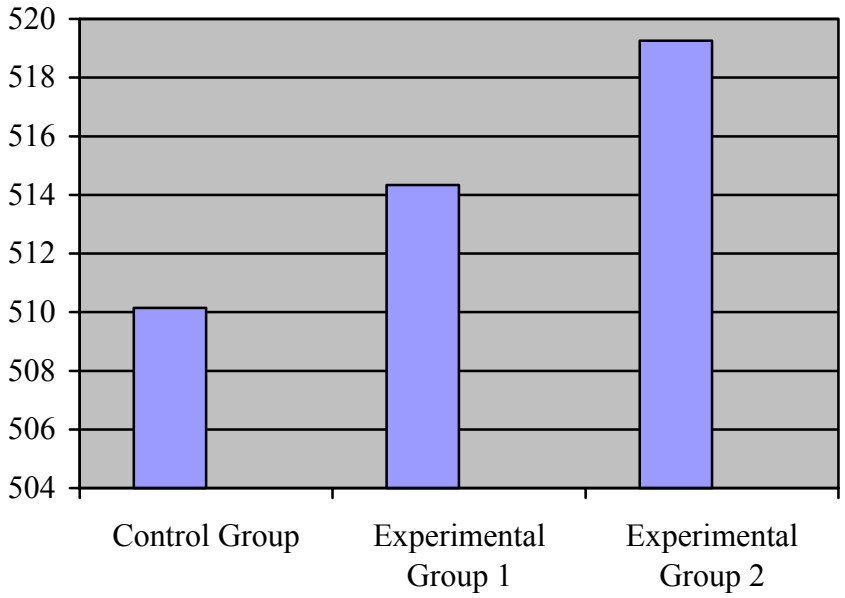

Figure 1

Graph Detailing Dependent Variable (GHSGT) Adjusted Means

Table 6

ANCOVA of Between-Subjects Effects for 3 Groups

Source	SS	df	MS	F	p#
Covariate (ITBS)	53311.5	1	53311.5	304.25	.000
Group	16804.4	2	8402.2	47.95	.000
Error	210442.9	1201	175.2		
Total	320985511.0	120			

Table 7

Means and Standard Deviations of GHSGT Scores by Gender

Group	Gender	Mean	Std. Dev.	N
Control (2000-2001)	Female	508.6	13.66	142
	Male	512.1	14.96	133
Exp. 1 (2001-2002)	Female	511.9	12.74	172
	Male	518.7	14.31	143
Exp. 2 (2002-2003)	Female	516.4	15.35	309
	Male	521.4	15.16	306
Total	Female	513.4	14.63	623
	Male	518.6	15.34	582

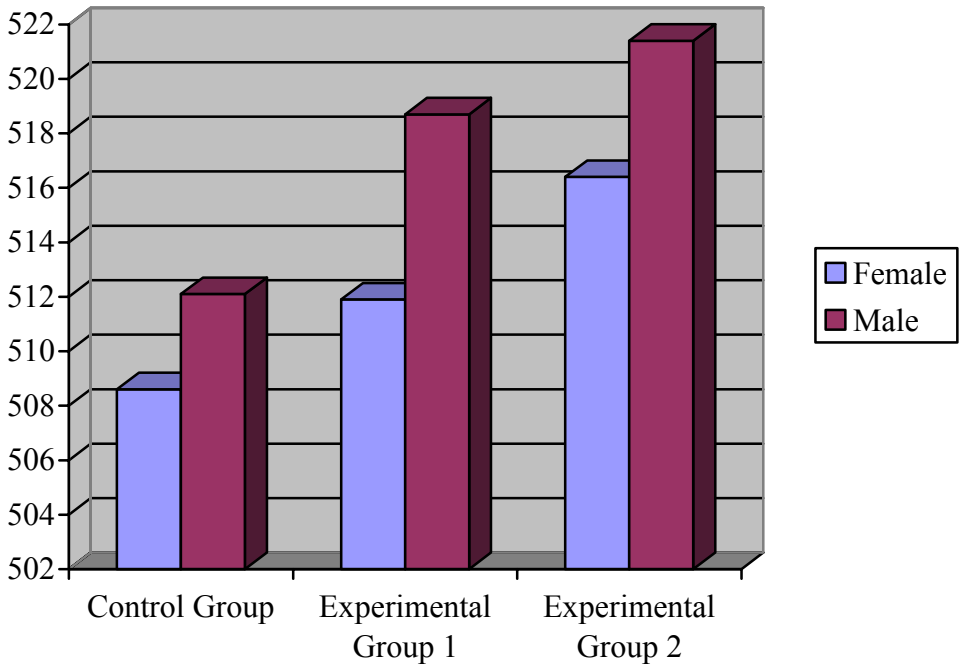

Figure 2

Means and Standard Deviations of GHSGT Scores by Gender

Based on the relationship of the covariate to the GHSGT scores the means of each group were adjusted. These adjusted means are presented in Table 8 and provided graphically in Figure 3. The female students' adjusted mean score for the control group was 509.1 and changed to 511.8 with experimental group 1, and to 516.8 with experimental group 2. The male students' adjusted mean score for the control group was 511.3 and changed to 517.4 with experimental group 1, and to 521.8 with experimental group 2.

According to the statistical data found in Table 9 the analysis based on gender within the group was not significant given $F_{2, 1198} = 1.45$, p # .234. When gender was separated out of the group, the data showed a significant difference in scores given $F_{1, 1198} = 28.53$, p # .000. The results provided evidence that the Dacula High School Science GHSGT Professional Development Program treatment was equally effective among the groups based on gender, relative to the science portion of the GHSGT.

The data were disaggregated based on the ethnicity of the participants. The means, standard deviations, and number of participants in each subgroup are presented in Table 10. The means are presented graphically by ethnicity in Figure 4. The means of each group (ethnic background) showed an overall increase each year the treatments were performed. The White students' mean score for the control group was 511.2 and changed to 515.3 with experimental group 1, and to 519.6 with experimental group 2. The African American students' mean score for the control group was 496.7 and changed to 512.8 with experimental group 1, and to 516.5 with experimental group 2. The Hispanic students' mean score for the control group was 496.8 and changed to 506.2 with experimental group 1, and changed to 499.3 with experimental group 2.

Table 8

Adjusted (GHSGT) Means Based on Gender

Group	Gender	Adjusted Means	Std. Error
Control (2000-2001)	Female	509.1	1.09
	Male	511.3	1.13
Exp. 1 (2001-2002)	Female	511.8	1.00
	Male	517.4	1.09
Exp. 2 (2002-2003)	Female	516.8	.74
	Male	521.8	.75

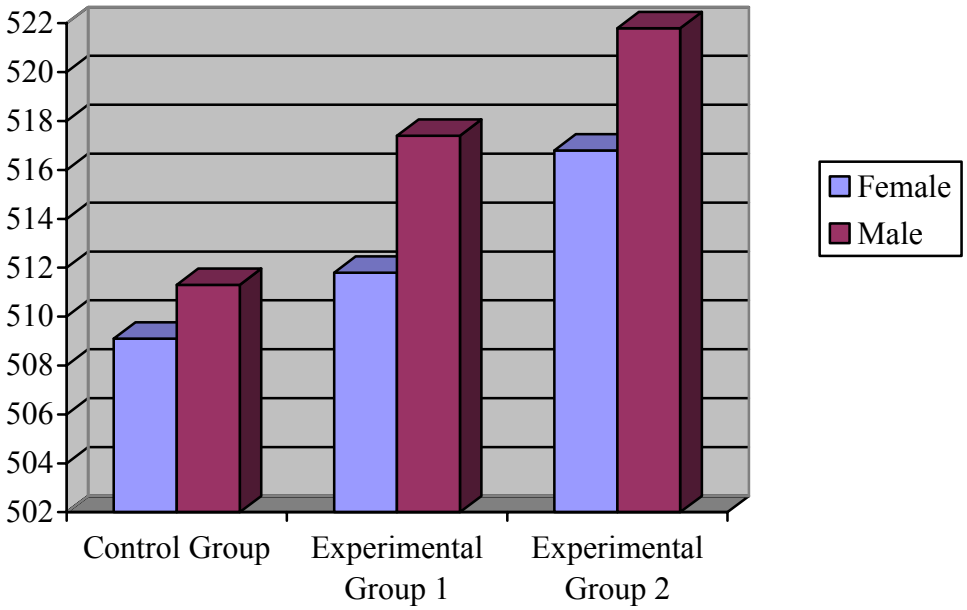

Figure 3

Adjusted (GHSGT) Means Based on Gender

Table 9

Two-Way ANCOVA by Group and Gender

Source	SS	df	MS	F	p#
Covariate (ITBS)	51614.4	1	51614.4	303.40	.000
Group	16447.3	2	8223.7	48.34	.000
Gender	4854.1	1	4854.1	28.53	.000
Group*Gender	494.33	2	247.167	1.45	.234
Error	203804.9	1198	170.1		
Total	320985511.0	1205			

Table 10

Means and Standard Deviations of GHSGT Scores by Ethnicity

Group	Ethnicity	Mean	Std. Dev.	N
Control (2000-2001)	White	511.2	13.73	248
	African American	496.7	18.05	15
	Hispanic	496.8	10.91	4
	Asian	513.5	15.41	6
	Multiracial	519.5	12.02	2
Exp. 1 (2001-2002)	White	515.3	13.88	288
	African American	512.8	15.98	17
	Hispanic	506.2	9.12	5
	Asian	510.8	5.81	5
	Multiracial	----	----	0

(Table continues)

Table 10 (continued)

Means and Standard Deviations of GHSGT Scores by Ethnicity

Group	Ethnicity	Mean	Std. Dev.	N
Exp. 2 (2002-2003)	White	519.6	15.15	559
	African American	516.5	12.57	18
	Hispanic	499.3	8.30	15
	Asian	516.9	21.11	20
	Multiracial	513.3	5.78	3
Total	White	516.6	14.89	1095
	African American	509.3	17.42	50
	Hispanic	500.3	9.08	24
	Asian	515.3	18.23	31
	Multiracial	515.8	8.01	5

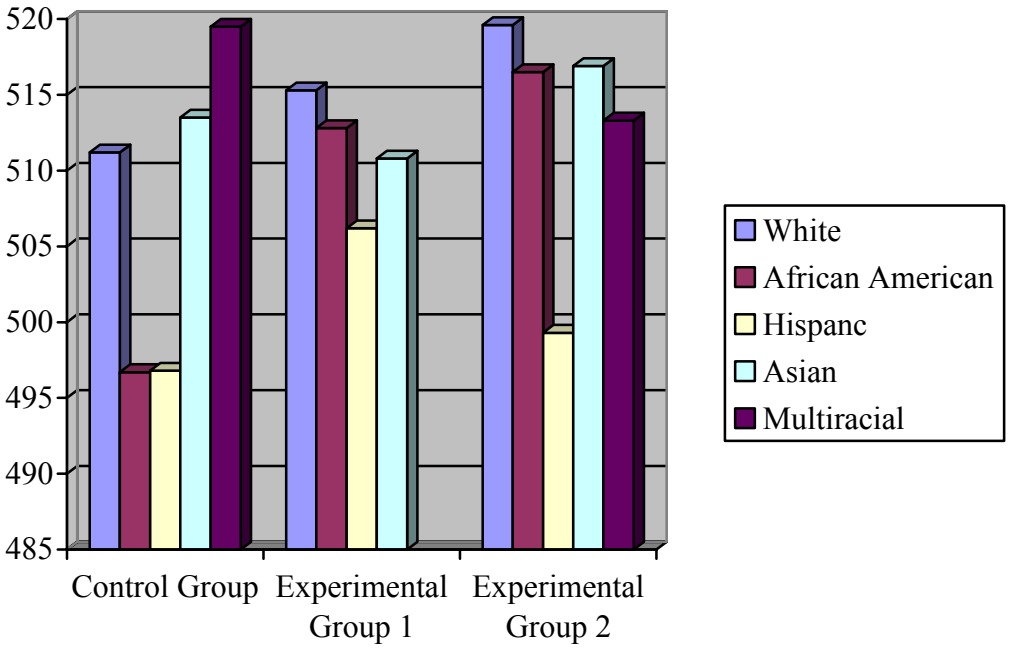

Figure 4

Means of GHSGT Scores by Ethnicity

The Asian students' mean score for the control group was 513.5, changed to 510.8 with experimental group 1, and to changed to 516.9 with experimental group 2. The Multiracial students' mean score for the control group was 519.5, did not have any participants in experimental group 1, and changed to 513.3 with experimental group 2.

Based on the relationship of the ITBS (covariate) to the GHSGT the means of each group were adjusted. These adjusted means are presented in Table 11 and provided graphically in Figure 5. The White students' adjusted mean score for the control group was 510.7 and changed to 514.5 with experimental group 1, and to 519.6 with experimental group 2. The African American students' adjusted mean score for the control group was 501.0 and changed to 514.9 with experimental group 1, and to 521.1 with experimental group 2. The Hispanic students' adjusted mean score for the control group was 504.2 and changed to 506.0 with experimental group 1, and changed to 503.7 with experimental group 2. The Asian students' adjusted mean score for the control group was 513.1 and changed 514.4 with experimental group 1, and to 519.0 with experimental group 2. The Multiracial students' adjusted mean score for the control group was 518.9, did not have participants in experimental group 1, and changed to 520.8 with experimental group 2.

According to the statistical data found in Table 12 the analysis based on ethnicity within the group was not significant given $F_{7,\ 1190} = 1.39$, p # .206. When ethnicity was separated out of the group, the data showed a significant difference in scores given $F_{4,\ 1190} = 3.25$, p # .012. The results provided evidence that the Dacula High School Science GHSGT Professional Development Program was equally effective among the groups based on ethnicity, relative to the science portion of the GHSGT.

Table 11

Adjusted Means and Standard Error of GHSGT Scores by Ethnicity

Group	Ethnicity	Mean	Std. Error
Control (2000-2001)	White	510.7	.83
	African American	501.0	3.39
	Hispanic	504.2	6.57
	Asian	513.1	5.35
	Multiracial	518.9	9.27
Exp. 1 (2001-2002)	White	514.5	.77
	African American	514.9	3.18
	Hispanic	506.0	5.87
	Asian	514.4	5.87
	Multiracial	----	----
Exp. 2 (2002-2003)	White	519.6	.56
	African American	521.1	3.10
	Hispanic	503.7	3.40
	Asian	519.0	2.94
	Multiracial	520.8	7.59

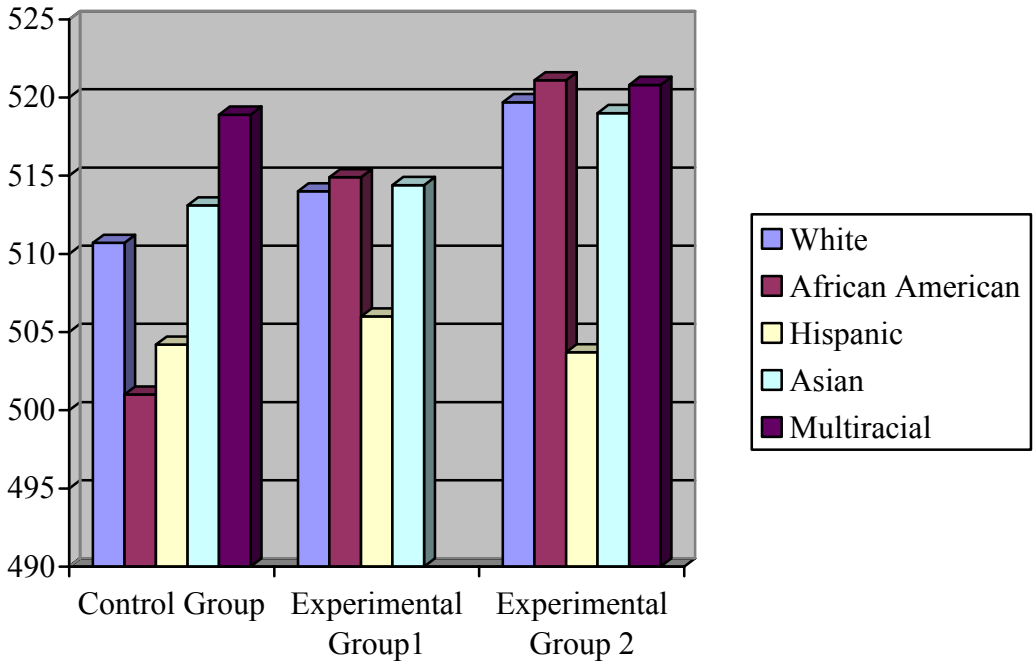

Figure 5

Adjusted Means of GHSGT Scores by Ethnicity

Table 12

Two-Way ANCOVA by Group and Ethnicity

Source	SS	df	MS	F	p#
Covariate (ITBS)	48264.9	1	48264.9	280.6	.000
Group	879.2	2	439.6	2.56	.078
Ethnicity	2229.9	4	557.5	3.25	.012
Group*Ethnicity	1671.1	7	238.7	1.39	.206
Error	204686.0	1190	172.0		
Total	320985511.0	1205			

The data were disaggregated based on the socioeconomic (income) level of the participants based on their participation in the free and/or reduced lunch program at Dacula High School. The students that were participants in the free and/or reduced lunch program at Dacula High School were identified based on the State of Georgia qualifications for students (families) based on their total family level of income, and successful eligibility (free and/or reduced lunch) based on the current year's requirements. The means, standard deviations, and number of participants identified as low-income status are presented in Table 13. The means are presented graphically based on this low status in Figure 6. The means of this group (low socioeconomic level) increased each year the treatments were performed. The students' mean score for the control group was 506.0 and changed to 510.8 with experimental group 1, and to 513.2 with experimental group 2.

Based on the relationship of the covariate to the posttest the means of each group were adjusted. These adjusted means are presented in Table 14 and provided graphically in Figure 7. The students' adjusted mean score for the control group was 506.2 and changed to 511.9 with experimental group 1, and to 515.8 with experimental group 2.

According to the statistical data found in Table 15 the analysis based on socioeconomic status was not significant given $F_{1,\ 1198} = 11.14$, p # .801. When socioeconomic status was separated out of the group, the data was also not significant given $F_{2,\ 1198} = 1.49$, p # .227. The results provided evidence that the Dacula High School Science GHSGT Professional Development Program was not equally effective among the groups based on socioeconomic status even though an increase in these student's scores was noted.

Table 13

Means and Standard Deviations of GHSGT Scores Based on F/R Lunch

Group	Mean	Std. Deviation	N
Control (2000-2001)	506.0	20.94	21
Exp. 1 (2001-2002)	510.8	13.95	29
Exp. 2 (2002-2003)	513.2	18.54	44
Total	515.9	15.19	94

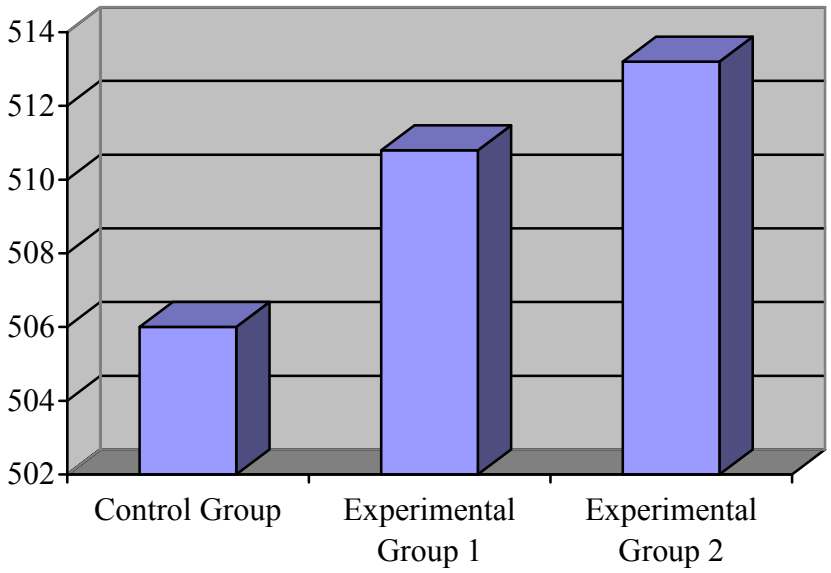

Figure 6

Means of GHSGT Scores Based on Free/Reduced Lunch

Table 14

Adjusted Means and Standard Error of GHSGT Scores Based on F/R Lunch

Group	Adjusted Mean	Std. Error
Control (2000-2001)	506.2	4.18
Exp. 1 (2001-2002)	511.9	3.67
Exp. 2 (2002-2003)	515.8	2.24

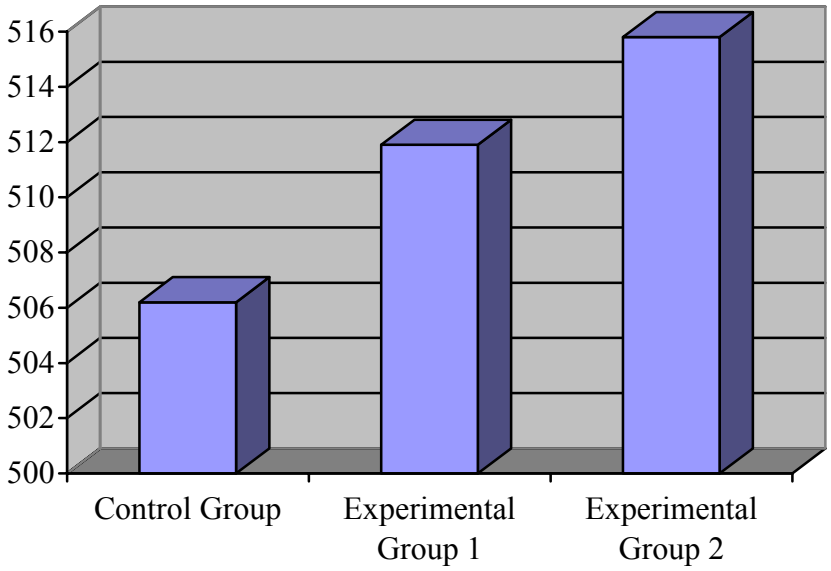

Figure 7

Adjusted Means of GHSGT Scores Based on Free/Reduced Lunch

Table 15

Tests of Effects by Group and Free/Reduced Lunch Status

Source	SS	df	MS	F	p#
Covariate (ITBS)	52381.6	1	52381.6	299.19	.000
Group	1476.0	2	738.0	4.22	.015
Low Income	520.6	2	260.3	1.49	.227
Group*Low Income	11.1	1	11.1	.064	.801
Error	209745.5	1198	175.1		
Total	320985511.0	1205			

Summary

The purpose of this study was to determine the effectiveness of the GHSGT Science Professional Development Program as it related to Dacula High School's student scores on the science portion of the GHSGT over a two-year period (2001-2002 and 2002-2003 school years). The study was comprised of all regular education students at Dacula High School who were in their junior year and who were taking the GHSGT for the first time. The standard scaled score was used for the science ITBS (covariate) and the GHSGT for all the students in this study. The research design was an ex-post facto study using the analysis of covariance as that statistical procedure to determine if the Dacula GHSGT science professional development program was effective in increasing student scores on the science portion of the GHSGT. An analysis of covariance (ANCOVA) was used to reduce the variation of the scores based on multiple years of student data used. This study tested the null hypothesis that there was no statistically significant difference in the adjusted mean scores on the science portion of the GHSGT of students whose teachers participated in the Dacula GHSGT professional development and students whose teachers had not participated in the professional development activity.

The results of the analysis of the data indicated that the Dacula GHSGT science professional development program was statistically significant in increasing student scores on the science portion of the GHSGT. The data also indicated that the program effectiveness increased over the second year that it was provided to the teachers. The analysis of the disaggregated data indicated that the Dacula High School Science GHSGT Professional Development Program treatment did not cause students of one gender,

ethnicity, or income level to perform at an increased or decreased level relative to other students on the science portion of the GHSGT. Based on the analysis of the data related to these groups, no significant differences were found. This indicates that the Dacula High School Science GHSGT Professional Development Program treatment was equally effective across all groups of students studied.

CHAPTER 5

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Chapter 5 provides a summary of the study, conclusions that relate to the analysis of the data collected in this study, and recommendations for needed changes in the treatment. This chapter also provides discussion relating to further literature and research related to this study that should be considered.

Summary

The purpose of this study was to determine the effectiveness of the GHSGT Science Professional Development Program as it related to Dacula High School's student scores on the science portion of the Georgia High School Graduation Test (GHSGT) over a two-year period (2001-2002 and 2002-2003 school years). All data were collected from existing records from Dacula High School in Gwinnett County, Georgia. The professional development activities consisted of two full day sessions (8 hours) during contract time and 10 one-hour sessions throughout the school year for teachers to work together on strategies to increase student achievement on standardized high-stakes tests, specifically the GHSGT. These release days provided the teachers with an overview of the test, scoring techniques, knowledge, and process skills. Teachers were given specific activities to implement in their classes and time to observe other teachers in similar activities.

The following research question guided this study:

What impact did the Dacula High School science GHSGT professional development program have on first-time testing students' scores on the science portion of the Georgia High School Graduation Test?

The null hypothesis for this study was as follows:

There is no statistically significant difference in the adjusted mean scores, based in the student's eighth grade ITBS (covariate) scores, on the science portion of the GHSGT of students whose teachers participated in the Dacula GHSGT professional development during the 2001-2002 and 2002-2003 school years and students whose teachers had not participated in the professional development activity.

The dependent variable was the adjusted science scores on the GHSGT, while the independent variable was the group to which the student belonged. The control group data were collected from the local school records based on the scores the students received in the 2000-2001 school year. The study was comprised of all regular education students at Dacula High School who were in their junior year and who were taking the GHSGT for the first time. The standard scaled score was used for the ITBS (covariate) and the GHSGT for all the students in this study. There were a total of 1205 students in the study. The research design was an ex-post facto study using the analysis of covariance as that statistical procedure to determine if the Dacula GHSGT science professional development program was effective in increasing student scores on the science portion of the GHSGT. The results of the analysis of the data indicated that the Dacula GHSGT science professional development program was statistically significant in

increasing student scores on the science portion of the GHSGT and was equally effective for all the groups tested.

Discussion

The professional development treatment that was employed at Dacula High School was research based. Weller and Weller (1998) described a method utilized at Winder-Barrow High School that used a "continuous improvement framework" and targeted raising test scores on standardized tests. The Continuous Improvement concept involved three phases: "(1) stabilizing the process by identifying and eradicating problems that are prohibiting the process from functioning like it should, (2) making active improvements in the process, and (3) monitoring and maintaining the process through continual improvement" (p. 161). The outcome of the framework enacted resulted in a significant increase in test scores and many other unmeasured favorable outcomes such as teacher pride and satisfaction (p. 165). The Dacula High School GHSGT professional development program identified problems relating to standardized test scores, used staff member's expertise to make improvements and enhancements to current practices, and continued the program and ultimately expanded it to other content areas. This study reaffirms many of the same successes identified by Weller and Weller (1998) at a similar high school in Georgia.

The Dacula High School GHSGT professional development program was based on the local school plan of improvement (LSPI) that identified reform based on known and accepted standards. According to Guzenhauser (2003), educators should look into following these recommendations when implementing a standards driven reform for their school: maintain dialogue between students, teachers, administrators and the educational

community, expand internal accountability while engaging high standards, continually providing higher order concepts to the students, provide funding to support goals of the school and not the scores on the standardized tests, develop alternative goals while taking community responsibility for all schools (p. 57). This study confirms the practice of using staff member's to help develop and implement professional development programs. This study provided a statistically significant increase in student standardized test scores based on professional development that used teacher discussion and collaboration to determine the needs of the students and to put standards in place within the local school.

Specific guidelines were considered prior to the development of the program. The GHSGT professional development program at Dacula High School was based on the following ideas:

- Teaching science content that aligned the Gwinnett County curriculum with the science content found on standardized tests such as the GHSGT.
- Teaching test taking skills to the students and applying similar type test questions to the assessments provided in science courses.
- Simulation activities provided to the students that provide practice tests similar to the GHSGT.
- Providing students and teachers reliable information regarding the use and importance of the data collected by standardized tests.
- Discussion and mentoring for the science teachers throughout the program.

Miyasaka (2000) described five types of test preparation practices that help students show their knowledge and skills on high-stakes tests. The identified practices were as follows: "(a) teaching the content domain, (b) using a variety of assessment approaches and

formats, (c) teaching time management skills, (d) fostering student motivation, and (e) reducing test anxiety" (p. 43). Many of the areas enacted through the professional development program at Dacula High School are supported and endorsed by Miyasaka. This study affirmed the need to teach the content, to provide students with time management skills, teach skills to reduce student test anxiety, and develop methods to increase student motivation.

This study disaggregated the data based on the students' gender, ethnicity and income level. Calhoun (1994) argued that "data need to be organized so it can be determined if there are group differences among learners in the school – such as differences in success rates between girls and boys, and among various ethnic groups and among socioeconomic levels" (72). The disaggregation of the data can "help faculty members identify problems and provide them with information that guides action" (p. 72). This study found that the program was effective within all groups of students. If there were any significant differences among the groups in this study additional research would have been needed to determine the specific area of action needed. The equality among the groups will allow future expansion of this study to additional content areas. Davenport (2002) noted how data disaggregation "allows administrators and teachers to base their planning and instructional decisions on fact, diagnose problems, and work together to close gaps in student achievement" (p. 61). If further research is conducted toward other standardized tests or professional development the disaggregation of the data will help determine if any gaps in achievement exist and needed change to the program.

This program was enacted as a result of the Local School Plan of Improvement developed for Dacula High School. Fullan (1982) supported this action with the statement that "strategic and operational practices in any school system must place the majority of its focus on one particular outcome, student achievement" (p.4). With this in mind, Dacula High School implemented professional development initiatives that promoted increased student achievement on the tests they are evaluated with. Additionally, Schlechty (2002) stated, "equally important to test scores is the quality of plans for addressing issues that come up when test scores indicate that there is a problem" (p. 93). The professional development program at Dacula High School focused on the specific areas the staff members teach, as well as, the deficient areas found from the disaggregated data. This study supported the indication that once the deficiency is addressed statistically significant changes can be shown through pertinent professional development.

The professional development program at Dacula High School provided for teachers within the school to help develop and implement the program. To this end, Neill (1997) described how using test related data along with teacher collaboration about the scores "helps teachers improve their practice and simultaneously works to improve their schools" (p. 38). Through this professional development program teams were developed to determine the students strengths and weaknesses on the science portion of the GHSGT. Teachers with expertise in these areas were used for their knowledge of subject and content material. According to Schlechty (2002), the principal should "encourage the faculty to work together to create a solution to the problems identified" as well as possibly holding "a one- or two-day faculty retreat" (p. 33). The principal at Dacula

High School provided the time and resources for this program. This study supports the release time and teacher collaboration.

The principal at Dacula High School presented the science department with a challenge and allowed the teachers to develop a program that would address the needs of the school. This study provides affirmation to this end similar to Schlechty's (2002) statement, "the primary function of a leader is to inspire others to do things they might otherwise not do and encourage others to go in directions they might not otherwise pursue" (p. xx). Schlechty additionally argued, "as leaders, great teachers understand that the needs and interests of those they want to follow them" (p. xviii).

Allen and Calhoun (1998) described a substantial increase in the "ongoing opportunities for everyone involved reflecting together about the underpinnings of action research". Additionally, "the content of professional development" was described as needing to be focused on a "more supportive, nurturing community" (p. 709). There also needed to be an effort on the part of the facilitators and organizers to "recognize that the process must be relevant to the individual questions and classroom needs of teachers if they are expected to take part" (p. 710). They concluded that the "time for collaborative work and the support of others are essential to successful school-wide action research" (p. 710). This study affirms the effectiveness of collaborative, school-based action research.

Conclusions

Based on the findings and limitations of this study, the analyzed data provided for the following conclusions:

1. The Dacula High School GHSGT science professional development program proved to be an effective method for increasing student test scores on the science portion of the GHSGT.
2. The Dacula High School GHSGT science professional development program increased its effectiveness as it was provided to teachers for a second year based on students' scores on the science portion of the GHSGT.
3. The Dacula High School GHSGT science professional development program was equally effective in increasing student scores on the science portion of the GHSGT.

The Dacula High School GHSGT science professional development program was a significant factor resulting in the statistically significant increase in student test scores on the science portion of the GHSGT over the two-year period that this study researched. Therefore, the program should be considered successful and expanded or improved based on the following:

1. Expand the professional development program to include the following additional areas tested on the GHSGT: Language Arts, Social Studies, Math, and Writing.
2. Incorporate other similar professional development programs that would seek to increase student scores on other standardized tests such as the AP Exams, PSAT, Gateway, and SAT.
3. Develop a vertical team to study this professional development program to determine if it can be applied at multiple levels such as Middle School or Elementary School.

4. Increase data collection to include student scores within the courses they are taking to determine if the program had an impact on their course grade or related knowledge and skills.

Recommendations

This study indicated that the professional development activities presented to the teachers were successful in increasing student test scores. This program was not the only factor in the students' scores on the GHSGT. Therefore, continuous efforts could be made at the local school, system level, and state level in order to make all attempts to meet the needs of students and teachers as they prepare to take standardized tests. Schools should prepare their staff and students for continuous improvement and, according to Neill (1997) "help teachers improve their practice and simultaneously work to improve their schools" (p. 38).

Based on the limitations and findings of this study, the following recommendations for further study are made:

1. Expand the research in this area to include "at risk" students and students with disabilities. These students often require additional help with standardized tests and may receive some benefit from a program such as this.
2. Longitudinal studies should be conducted to determine the effectiveness of this professional development program as it might relate to other standardized tests. This study was effective at increasing student scores on the GHSGT but might also be effective toward increasing scores on other required or recommended tests.

3. Further studies should be conducted to determine if this program or a program similar to this one would be effective at increasing student achievement in other areas, such as end of course tests, final exams, or final course grades.
4. Surveys could be used to determine how the staff members perceived the study as it related to student achievement and test preparedness.

This study concluded that the GHSGT staff development program administered at Dacula High School was particularly effective at increasing student scores on the science portion of the GHSGT. There has been some discussion in the State of Georgia about removing the GHSGT and replacing it with end of course exams. If the GHSGT were replaced this program could be transitioned to support the end of course exams. The staff development program resulted in many positive changed in the school that were not examined in this study. Peer collaboration is a necessary component to teams of teachers seeking student achievement increases. This program was developed and delivered by the teachers at Dacula High School. When teachers work together, many positive changes occur. This program was particularly effective in the second year. Many professional development programs do not include the coaching and carryover component that this one provided. This extension of the program provided everyone involved with the confidence that the students were receiving instruction that was aligned and beneficial. This program will be transitioned to include other departments and may reach across school levels to include vertical teaming opportunities between the middle school and high school. Overall this program and study became a positive growth opportunity for the school and the staff members involved.

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APPENDIX A

APPROVAL LETTER FROM DACULA HIGH SCHOOL

DACULA HIGH SCHOOL
123 BROAD STREET, DACULA, GEORGIA 30019
PHONE: (770) 963-6664

DONALD W. NUTT
Principal

GWINNETT COUNTY PUBLIC SCHOOLS

J. ALVIN WILBANKS
SUPERINTENDENT

June 25, 2003

The University of Georgia
Human Subjects Office
606A Boyd Graduate Studies Research Center
Athens, Georgia 30602-7411
(706) 542-3199

Dear Human Subjects Office Personnel:

This letter is to notify you that Assistant Principal, Steven Flynt, is authorized to use existing and potential data on student achievement and standardized test scores from Dacula High School. More specifically, he has been authorized to use all students' scores on the Georgia High School Graduation Test from the 2000 to present school year test administrations and those same student's scores on the Stanford 9 and/or the ITBS. This information will help Dacula High School develop future targeted staff development programs. Please feel free to contact me if you need any additional information.

Sincerely,

Donald Nutt
Principal, Dacula High School

APPENDIX B

HUMAN SUBJECTS APPROVAL FORM

The University of Georgia
Graduate School

Dear Doctoral Candidate:

An approved copy of your application for Admission to Candidacy is enclosed for your files. A copy will be mailed to your departmental graduate coordinator.

Please be advised that there is a registration requirement and a time limit on completion of degree requirements. The Graduate School Bulletin statements on these requirements are as follows:

After admission to candidacy, a student must register for at least two additional semesters and a total minimum of 10 hours of dissertation or other appropriate credit. (See the appropriate section for your degree in the Graduate Bulletin.)

A candidate for the doctoral degree who fails to complete all degree requirements within five years of passing the comprehensive examinations and being admitted to candidacy will be required to take the comprehensive examinations again and be admitted to candidacy a second time. (See "Time Limit" in the appropriate section for your degree in the Graduate Bulletin.)

If you have not applied for graduation, an application for graduation is available on the Graduate School website. We hope you will feel free to contact this office any time you have questions.

Sincerely,

Krista Haynes
Graduate Program Administrator

KH/lkd

Boyd Graduate Studies Research Center • Athens, Georgia 30602-7401 • Area Code 706 • FAX 542-3219
Dean's Office 542-4788 • Associate Dean's Office 542-4811 or 542-4795 • Business Office 542-4798
Director of Recruitment & Retention 542-4790 • Admissions 542-1739 • Records & Graduation 542-4803
An Equal Opportunity/Affirmative Action Institution

The University of Georgia
Office of The Vice President for Research
DHHS Assurance ID No. : FWA00003901

Institutional Review Board
Human Subjects Office
606A Graduate Studies Research Center
Athens, Georgia 30602-7411
(706) 542-6514; 542-3199
Fax No. (706) 542-5638

RESEARCHER REQUEST FORM

Request Date: 2003-07-09 **Project Number:** H2004-10021-0

Name	Title	Dept/Phone	Address	Email
Mr. Steven William Flynt	PI	Educational Leadership Rivers Crossing +4808		
Dr. C. Thomas Holmes	CO	Educational Leadership 313 Rivers Crossing +4808 542-0913		

Title of Study: An Assessment of the Science Staff Development Program at Dacula High School as it Related to Student Achievement on the GHSGT

45 CFD Category: Administrative **Renew :** No **Change(s) :**

Approved : 2003-07-20 Begin date : 2003-07-20 Expiration date : 2004-07-19

NOTE: Any research conducted before the approval date or after the end data collection date shown above is not covered by IRB approval, and cannot be retroactively approved.

Number Assigned by Sponsored Programs: **Funding Agency:**

Form 310 Provided: No

Attention, Principal Investigator!
The major investigator must complete and return this form
on or before the approval end date shown above.

1. See Reverse	For approval of changes you must complete and sign the back of this form. (Also attach a copy of any revised instruments or consent forms, with changes highlighted, where applicable.)
2. See Reverse	For an extension of the approval period you must complete and sign the back of this form.
3. See Reverse	Data collection has been completed as approved by the IRB, and this file can now be closed. Federal laws & UGA policies require notification of completion of data collection.

The University of Georgia
Office of The Vice President for Research
DHHS Assurance ID No. : FWA00003901

Institutional Review Board
Human Subjects Office
606A Graduate Studies Research Center
Athens, Georgia 30602-7411
(706) 542-6514; 542-3199
Fax No. (706) 542-5638

APPROVAL FORM

Date Proposal Received: 2003-07-09 **Project Number:** H2004-10021-0

Name	Title	Dept/Phone	Address	Email
Mr. Steven William Flynt	PI	Educational Leadership Rivers Crossing +4808		
Dr. C. Thomas Holmes	CO	Educational Leadership 313 Rivers Crossing +4808 542-0913		

Title of Study: An Assessment of the Science Staff Development Program at Dacula High School as it Related to Student Achievement on the GHSGT

45 CFR 46 Category: Administrative 4 Modifications Required for Approval and Date Completed:

Approved : 2003-07-20 Begin date : 2003-07-20 Expiration date : 2004-07-19

NOTE: Any research conducted before the approval date or after the end data collection date shown above is not covered by IRB approval, and cannot be retroactively approved.

Number Assigned by Sponsored Programs: **Funding Agency:**

Form 310 Provided: No

Your human subjects study has been approved as indicated under IRB action above.

Please be aware that it is your responsibility to inform the IRB . . .
. . . of any adverse events or unanticipated risks to the subjects or others within 24 to 72 hours; . .
. . . of any significant changes or additions to your study and obtain approval of them before they are put into effect; . . .
. . . that you need to extend the approval period beyond the expiration date shown above; . . .
. . . that you have completed your data collection as approved, within the approval period shown above, so that your file may be closed.

For additional information regarding your responsibilities as an investigtor refer to the IRB Guidelines.
For your convenience in obtaining approval of changes, extending the approval period, or closing your file, we are providing you with a blue Researcher Request form. Detach this blue form, complete it as appropriate, sign and date it, then return it to the IRB office. Keep this original approval form for your records.

Copy:
Dr. William G. Wraga
Dr. Sally J. Zepeda

Christina A. Joseph, Ph.D.
Chairperson, Institutional Review Board

APPENDIX C

PROFESSIONAL DEVELOPMENT PRE-ADVISEMENT FORM

PROFESSIONAL DEVELOPMENT PRE-ADVISEMENT

DATE: _____

Participant's Name: _____

Address: _____
Street City State Zip Code

Home Phone _____ Social Security #: _____

Location #: _____ School Name: _____

Grade or Subject Area Taught: _____

I am presently employed at Gwinnett as:

_____ Teacher _____ Media Specialist _____ Parapro

_____ Leadership _____ Counselor

_____ Other _____(specify)

_____ I am not presently a GCPS employee
(Substitute teachers would check here)

Course Title: _____

Instructor: _____

Contact Hours: _____ # SDUs: _____

THIS COURSE IS IN AN AREA OF ASSESSED NEED FOR THIS PARTICIPANT,

_____
Signature of Administrator/Supervisor*
(Applicable to GCPS employees only)

* This signature should be from one of the following:

a. Principal
b. Assistant Principal
c. Department Chair
d. Subject Area Coordinator

Revised: Sept. 1997

APPENDIX D

PROFESSIONAL DEVELOPMENT PROPOSAL FORM

LOCAL SCHOOL PROFESSIONAL DEVELOPMENT PROPOSAL FORM

Principal's Signature _____

School Name/Location: Dacula High School #325

Title of Activity (40 characters/spaces): Dacula High School Science Professional Development

Instructor/Location: DHS Science Teachers Internal Contact Person: Steve Flynt

No. of Contact Hours: 20 No. of SDUs to be Awarded: 2

Stipend Funding Source: N/A Stipend Amount to be Awarded: N/A

Target Audience: Dacula High School Science Teachers No. of Participants: 15

Brief Description of Activity: Class will be presented in 2 full days and 2 afternoon meetings. Dacula High School teachers will participate in 2 full day sessions and 4 hours of peer observations and discussions. The first group of classes will focus on an introduction to the GHSGT and scoring techniques. Communication, knowledge, and process skills will be investigated individually then linked together in the actual scoring of practice GHSGT. Teachers will be given peer observations to complete and discuss for the next session. The second session will focus on strategies to implement GHSGT instruction and review techniques in the classroom. Teachers will discuss their students' activities and practice test results in small groups. Discussions will follow on additional strategies for improving GHSGT scores at the local level.

Proposed Course Meets Goal Area(s) A, B, D and/or System Initiative(s) # 1, 2, 3: A, D, Goal 10

Describe How This Activity Relates to the Goal Area(s), System Initiative(s) and/or LSPI:
This professional development activity will help increase student achievement on standardized tests such as GHSGT listed in the Dacula High School LSPI.

Exact Dates/Times for all Sessions of the Activity:

8hrs Thursday, November 8, 2001	Lawrenceville East
2hrs Tuesday, November 27, 2001	Dacula High School
2hrs Wednesday, January 16, 2002	Dacula High School
8hrs Wednesday, February 27, 2002	Lawrenceville East

Location of Activity: Dacula High School and Lawrenceville East

Criteria for Participant Selection (if applicable): Dacula High School science teachers

Rationale and Description of Mastery Verification; In-class Assessment (required):
Instructors will provide in class assessments on grading locally produced gateway papers.

You may submit a computer reproduction of this document as long as it contains the required information.

Revised January 1998

GENERAL INSTRUCTIONS FOR COMPLETING A LOCAL SCHOOL PROFESSIONAL DEVELOPMENT COURSE PROPOSAL

Signature: Secure signature of principal.

School/Location Number: Name of primary school and the location

Title of Activity: Limit title to a total of 40 characters/spaces
Example: Integrating Classroom Technology (32 characters/spaces) not

Instructor/Location: Name primary instructor and instructor's location.

Internal Contact Person for Activity: Identify GCPS employee to be contacted should questions arise. Give location and phone number.

Number of Contact Hours:
Increments are 10 contact hours = 1 SDU
20 contact hours = 2 SDUs
30 contact hours = 3 SDUs
40 contact hours = 4 SDUs
50 contact hours - 5 SDUs

No partial credit can be given, (e.g., 14 contact hours equal 1 SDU)

Stipend Funding Source: State how stipend is to be paid -- PDS funds or other (local funds, grant, etc.).

Stipend Amount to be Awarded: Indicate stipend amount. PDS must be awarded in increments of $150. Schools can opt to pay a minimum stipend of $150 regardless of the number of SDUs awarded, e.g., $150 stipend for a 3 SDU class.

Target Audience: Briefly describe group being instructed.

Number of Participants: Indicate anticipated class size and number of PDS contracts.

Brief Description of Activity: Describe nature of course content. Remember state guidelines prohibit awarding SDU credits for curriculum development.

Proposed Course Meets Goal Area(s) and/or System Initiative(s): Circle goal areas and/or system initiatives that the course supports. (Attached is a copy of the system goals and initiatives for your use.)

Goal Areas

A. Student Achievement - Goals 1, 2, 3, 4, 5, 6, 9
B. Safe and Secure Schools - Goal 7
C. Good Work Habits - Goal 8
D. Continuous Quality Improvement - Goal 10

Describe How This Activity Relates to the Goal Area(s), System Initiative(s), and/or LSPI: Briefly describe how course can be utilized to support these areas, e.g., teaching strategies that reflect AKS to ensure student achievement; techniques for improving safety and security.

Exact Dates/Times for All Sessions: Indicate dates and times for all activities. Actual beginning and ending dates are critical for meeting state certification requirements. No more than eight contact hours of instruction can be conducted per day with a maximum of 4 SDUs earned per week. Any changes in the schedule can be noted when the course completion materials are turned in to Professional Development in preparation for issuing of SDUs.

Location of Activity: Name place where class is going to meet.

Criteria for Participant Selection: Specify criteria, if needed. This category usually applies when PDS activities require administrator nominations.

Rationale and description of Mastery Verification: Provide reason for offering course and how course will be assessed. The state requires an "in-class assessment" of participants to verify mastery of course objectives. Examples might include the development of a lesson plan, a demonstration of competence with technology, or a presentation of a class project.

On-the-Job Assessment: Indicate whether actual observation of classroom application (of course learning) will be conducted. An "on-the-job assessment" is optional.

Note: Your completed proposal form and any necessary documentation should be received by the Professional Development Department prior to the beginning of the activity. Proposals cannot be approved if they are submitted after the activity has begun.

APPENDIX E

GHSGT SCIENCE PROFESSIONAL DEVELOPMENT AGENDA

GHSGT Professional Development Outline / Release Day 1

7:00 am Icebreaker & Breakfast Snacks

- Informal discussion on how each teacher prepares students for participation on standardized tests
- What standardized tests are administered to students in high school?
- What tests are linked to the science curriculum and how?

7:45 am Science Communication

- Formal and informal science communication
- Science knowledge and processes
- GHSGT Science content overview
- GHSGT Preparation Handbook overhead transparencies

10:00 am Director of Science Education / Gwinnett County Public Schools

- Science standardized testing schedules
- Importance of standardized tests
- Using Standardized test results to enact change within the local schools
- Future state and county standardized testing plans
- End of Course Exams
- Questions

10:45 am Director of Assessment / Gwinnett County Public Schools

- Overview of county and state standardized testing programs
- Gwinnett County Mission and Vision
- Gwinnett County Strategic Goals and how they relate to testing
- Importance of teacher and student preparation for standardized tests
- Questions

11:30 am Lunch Break

12:30 pm Video / "Who Moved My Cheese"

- Large Group Discussion
  - Why change is needed
  - Change we have seen at Dacula
  - Changes in standardized testing

1:30 pm Group Work

- Groups of 3 or 4
  - Review content in GHSGT Preparation Handbook
  - Discussion of content and links to Gwinnett County curriculum
  - Schedule days for student activities
  - Schedule with other teachers for peer observations and discussions

2:30 pm Large Group Discussion

- Select spokesman to give small group major discussion details
- Questions and Closure

GHSGT Professional Development Outline / Release Day 2

7:00 am Icebreaker & Breakfast Snacks

- Group discussion
- Positive and negative aspects of activities implemented
- Discuss positive peer observation experiences
- Student reactions to activities and discussion

8:00 am GHSGT Content Overview

- Review GHSGT Handbook content
- Discuss prepared student review packets
- Science course preparation for success on GHSGT

9:00 am Pre-Georgia High School Graduation Test Simulator

- Software introduction
- Description of simulation activities available
- Teachers practice using software (student simulation)

11:30 am Lunch Break

12:30 pm Small Group Discussion

- Groups 3-4
- Discussion of content on computer software
- Develop additional activities that would work with or support the software
- Discuss test taking strategies to improve scores on the GHSGT

2:00 pm Large Group Work

- Discuss additional small group strategies and activities
- Schedule computer lab time for classes
- Questions and Closure

APPENDIX F

DEPARTMENTAL CERTIFICATION AND RECOMMENDATION

Application for Admission to Candidacy for Doctoral Degrees

The University of Georgia
Graduate School, Room 552 Boyd

Please submit three (3) copies of this form (one original and two copies) to the Graduate School

A prospective Doctoral candidate must be admitted to candidacy two semesters before the date of graduation

Name: STEVEN W. FLYNT SS# ___-___-___

Address: _____ Degree: EDD

_____ Major: EDUCATIONAL LEADERSHIP

It is expected the degree will be conferred in month: MAY Year: 2004

I understand that if human subjects are involved in my research, it is my responsibility to file a research protocol application with the Institutional Review Board (Boyd GSRC, Room 606) before I begin collecting data. I acknowledge that failure to secure this permission prior to conducting my data collection using human subjects will negate the use of that data for my doctoral dissertation.
(Human subjects information available at: http://www.ovpr.uga.edu/hso/)

[signature] 9/11/03

Student's Signature (all students must sign) Date

Certification and Recommendation of the Department :Please check all appropriate items:

☑ We have examined the entire graduate record of the student named above.An average of 3.0 (B) has been maintained on all graduate courses taken and on all completed graduate courses on the Program of Study. No course with a grade below C has been accepted as part of the Program of Study.
☑ Written and oral comprehensive examinations have been passed and reported to the Graduate School.
☑ A dissertation prospectus has been approved (if required for Candidacy).
☑ The residence requirement has been met.
We recommend that this student be admitted to candidacy for the degree indicated.

Approvals

Major Professor: [signature] Date: 9/11/03

Graduate Coordinator: [signature] Date: 9/11/03

Graduate Dean: [signature] Date:

Copy	Student	GraduateSchool	Graduate Coordinator

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Questions and/or comments to dkknox@arches.uga.edu