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The Impact Of Advanced Placement (ap) Participation And Success On School-wide Student Achievement

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THE IMPACT OF ADVANCED PLACEMENT (AP) PARTICIPATION AND SUCCESS ON SCHOOL-WIDE STUDENT ACHIEVEMENT

by

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ABSTRACT

The purpose of this study was to investigate two research questions concerning: (a) the relationship between the percentage of students within a high school who participated in the Advanced Placement program and the school-wide student achievement of a high school and (b) the relationship between the percentage of students within a high school who successfully performed in the Advanced Placement program and the school-wide student achievement of the high school.

It was determined in this study that there was a statistically significant relationship between Advanced Placement (AP) student participation and school-wide student achievement and there was a statistically significant relationship between AP student performance and school-wide student achievement in public high schools in the state of Florida in the 2007-2008 school year.

Additionally, information was provided for policymakers and practitioners regarding the impact of Advanced Placement on school-wide achievement and the impact on students outside the AP program. While AP participation and AP performance correlated with school-wide achievement, when the population and data were disaggregated into the most affluent, middle-income, and poorest schools, the results changed. For the poorest schools, there was no relationship between AP participation and school-wide student achievement. In the middle income and most affluent schools, however, there was a statistically significant relationship between AP participation and school-wide student achievement.

Additional confirmation that Advanced Placement, as part of the overall curriculum, had a significant impact on school-wide student achievement was provided. Further research is necessary to understand the implications of the AP program on schools of various socioeconomic levels.

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As I reflect on this journey, it is necessary to acknowledge those that supported me to get to this day. Although this journey had its challenges, it was a valuable process. As Albert Einstein said, “In difficulty, we find opportunity.” In every challenge or difficult moment, there was an opportunity to learn, to grow, to step back and to step forward.

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THE PROBLEM AND ITS CLARIFYING COMPONENTS

Introduction

In 1956, the College Board created a program to provide college-level coursework for high school students: the Advanced Placement (AP) program. Initially, the program served just a few students, but, in 2006, 1.3 million high school students took AP courses (Ewing, 2006). More high school students than ever have begun to take AP courses to potentially earn college credits. In 2006, high schools had an opportunity to offer a maximum of 37 courses in the AP program in 22 subject areas (College Board, 2006). A total of 60% of American high schools were offering at least one AP course according to *The New York Times* (2006). Even with this exceptional growth, high school educators have faced pressure to expand the AP program further. This pressure has come from national, state and local legislators, school boards, superintendents and other sources. Schools have been asked to increase the number of AP courses offered and to increase the number of students who take AP courses, especially the number of minority or low socioeconomic students who take AP courses. "We must encourage our kids to take more challenging courses, and the Advanced Placement program has been proven to make a difference in student performance," said U.S. Education Secretary Margaret Spellings (2005, p. 41). Furthermore, according to College Board President Gaston Caperton in the 2006 College Board report, "AP benefits students, educators and schools: students who succeed on an AP exam are more likely to complete college" (College Board, 2006, p. 15).

In the state of Florida, former Governor Jeb Bush repeatedly praised the virtues of the AP Program and applauded the state's high schools for expanding AP offerings. In fact, the legislators in Florida created a way to send extra weighted FTE (Full Time Equivalency) funding back to schools where students were successful in the AP Program (Florida Department of Education, 2006). After this legislation, AP participation and AP success for high school students increased according to the FDOE.

Morgan and Klaric's (2007) position that "One of the fundamental underpinnings of the AP Program is that students who perform well on AP examinations will be successful in college," (p. 1) has been debated in various studies. Dodd, Fitzpatrick, De Ayala, and Jennings (2002) had previously found that when AP students and non-AP students of similar abilities went to college, the AP students earned better grades. Adelman (1999) stated that the quality and rigor of the high school curriculum was the most important factor in college completion. Yet, Geiser and Santileces (2004) in their University of California at Berkley study, found that participation in Advanced Placement (AP) courses was not connected to increased grades in college.

Ewing (2006) created a summary of research on student outcomes regarding the AP program. She pointed out that research has been done regarding the following topics: AP teachers, the role of AP teachers in helping minority students, AP course enrollment, gender differences in AP, and predicting AP success. Ewing stated that most research had been conducted to evaluate the impact of AP in predicting "college performance, college completion and performance on national or international assessments" (p. 1).

Each of these studies was focused on the individual AP student or a group of AP students. However, the impact of AP on students outside of the program was not addressed. Some of the issues that have been raised relate to (a) the implications of this expansion of AP, (b) the potential for negative implications of an over-expansion of the program, and (c) the impact of AP participation and AP success on school-wide student achievement.

Significant arguments have been made on both sides of each of these issues. What has become clear is that the number of students taking AP courses has increased and is likely to continue to increase based on 21st century educational and legislative policies. It is important, as educators, to research and consider the implications of the AP program to the future of the nation's schools and students.

Conceptual Framework

Background and Development of Advanced Placement

The College Entrance Examination Board, a non-profit organization better known as the College Board, created the Advanced Placement (AP) program in the mid-1950s as a way for gifted high school students to earn college credit. The College Board was made up of a collection of high school teachers, high school administrators, college professors, college administrators, business leaders, non-profit leaders and politicians. The College Board started the AP program by offering AP English Literature and AP Calculus in a few high schools across the country in 1956. The intention was to meet the needs of a

few, gifted students in high schools by allowing these students to take college-level curriculum courses in high school. At the end of the course, students would take a nationally-standardized AP examination. By scoring at a level of 3, 4 or 5 on the exam, a high school student could potentially earn college credit dependent on the credit policy of the college or university the student would attend. AP exam scores ranged from 1-5 where 1= No Recommendation, 2 = Possibly Qualified, 3 = Qualified, 4 = Well Qualified, and 5 = Extremely Well Qualified (College Board, 2008).

In 2006, some 50 years after its inception, the AP program was much different than it had originally been envisioned. Students that were not classified as gifted counted for the majority of the AP student population. Due to a national, state and local push by legislators, school officials, superintendents and other sources, the AP program had dramatically expanded. Since the 1990s, the College Board had pushed for more participation in AP classes and AP exams, calling the initiative "Equity and Access for all Students" (2006). College Board President Gaston Caperton advocated for all students to have opportunities to take at least one AP course during their high school years (College Board, 2006). In 2001, United States Education Secretary Richard Riley set the goal of offering AP courses in every high school in the country to all levels of students (College Board, 2001). College Board officials were not alone in this quest as local, state and federal politicians lined up to support the College Board and the AP program with funding, resources and legislation. Superintendents, school boards and school administrators also praised the AP program as a way to bring rigor into the high school

curriculum for all students and as a method of increasing standardized test scores school-wide.

With the dramatic expansion of AP, the College Board recognized that challenges existed in maintaining the quality and integrity of the program. By favoring "Open Access" for all students to AP, schools risked not meeting the needs of students in an appropriate way. At times, students who were not prepared or lacked capacity were placed in courses where failure was almost guaranteed. Without some parameters defining the ability of the students, appropriate placement into AP courses by high school guidance counselors became a potential problem. Just because a student wanted to take AP did not mean the student belonged in AP courses. How could high school guidance counselors differentiate what students should be in AP Chemistry if there were no requirements or guidelines? A freshman high school student of average ability in science could have asked a counselor to take the AP Chemistry course (typically a course for advanced 11^{th} grade students) and have his wish granted under an "Open Access" policy.

Despite these potential pitfalls, the national, state and local push for AP expansion continued. President Bush and other political leaders praised the AP program and the College Board for exposing students of all types and backgrounds to college curriculum in high school. Numerous studies identified the AP program as a predictor of success in college and graduating from college in four years. The program was cited in various publications and political summits such as the National Governor's Association annual summit as an example of what was working in the nation's public schools. In the midst of this push for AP expansion, critics of the AP program in general surfaced.

Sadler (2006), a Harvard professor, questioned if AP courses had the necessary depth of a typical college course. If a high school student earned a passing score on an AP exam of 3, 4 or 5, the student could potentially skip a mandatory college course. If the student skipped an introductory course, some critics questioned if the student had grasped the necessary concepts and content in an AP course that the student would have had in a college introductory course. Sadler doubted that high school teachers had adequate experience or training to give students what they needed in a college course. Lichten (2003) commended efforts by the College Board to expand the AP program beyond the elite to the less fortunate; however, he stated that these efforts risk maintaining the integrity of the program by potentially diluting the rigor of the course. New York Times writer Tawar Lewin asked, "Does (AP) level the playing field and enrich the curriculum or does it feed the admissions frenzy and hijack the curriculum?" (2006, p. 23). She, like numerous others, argued that AP was not a predictor for college success for the AP student. These critics did not believe that taking an AP course correlated in any way with finishing college in four years or maintaining a high Grade Point Average (GPA) in college.

Despite the criticism, major funding sources such as the Gates Foundation continued to invest in the expansion of the AP program for all students, especially minority students. Programs such as the Springboard Curriculum for Language Arts and Math were created by the College Board to support the expansion. For minority students, AP represented a potential avenue into a college. By taking AP courses, minority students would be exposed to rigorous curriculum that would better prepare them for college.

Principals weighed in on the power of AP to transform students' lives. Award-winning school leaders felt that their school-wide student achievement on standardized tests increased through an increase in the number of students participating in the AP program.

This study sought to determine (a) if there was a relationship between school-wide student achievement and the percentage of students in a high school that participate in the AP program, and (b) if there was a relationship between school-wide student achievement and the percentage of students in a high school who successfully performed in the AP program. The setting for this study was the state of Florida. In 2008, the Florida Department of Education (FDOE) used the Florida Comprehensive Assessment Test (FCAT) as its standardized test to determine the school grade of each public school in the state and to meet the federal requirements of the No Child Left Behind (NCLB) Act.

For the purposes of this study, school grade points were utilized based on student FCAT scores in the areas of Reading, Math, Writing and Science. Using the FCAT and school grade to establish a relationship with AP has raised some issues since the FCAT has typically been administered to 9th and 10th grade high school students and AP courses and exams have been taken by 11th and 12th grade students. First, AP teachers do not often teach AP courses for the entire day. Therefore, the required training that AP teachers receive from the College Board to teach AP courses would benefit students of all grade levels even if students were not enrolled in an AP course. Second, some freshman and sophomore grade level students were enrolled in AP courses in 2008. AP Human Geography was offered across the state of Florida and the country to primarily 9th grade students according to College Board (2009). AP World History and AP Psychology were

also common courses at most high schools at the 9th and 10th grade level. Third, support programs for AP, such as the Springboard curriculum in Language Arts and Math are offered to students in grades 6-12, and all students in high school potentially benefit from such a program. Finally, the FCAT Science section is administered to 11th grade students who comprise a significant portion of the AP-taking students in Florida in 2008.

Based on current federal, state and local policy, the AP program has been projected to continue to expand at a significant rate. Legislators, school boards, superintendents, school officials and others praise the AP program as a vehicle for increasing school-wide student achievement. Critics reject this claim and question the merits of the AP program in general. This study was designed to address some of the questions regarding the AP program as a method of school-wide school improvement and also to understand the relationship between AP and school-wide school achievement.

Purpose of the Study

The purpose of this study was to determine if there was a statistically significant relationship between the percentage of students in a high school who participate in the Advanced Placement (AP) program and the school-wide student achievement in the high school as defined by the 2008 school grading system from the Florida Department of Education. This study was conducted to determine if there was a statistically significant relationship between the Advanced Placement (AP) performance in a high school of those students who chose to participate in the AP program within a school and the

school-wide student achievement in the high school as defined by the 2008 school grading system from the Florida Department of Education.

For this study, AP participation was determined by the number of students who completed at least one AP course and AP examination in the same subject area. For the purposes of this study, students were counted once rather than multiple times, regardless of the number of AP courses and AP exams in which they participated. AP participation was defined by students who completed the AP course in a subject area and the accompanying AP examination in the same subject area. Students who completed the AP course but did not complete the AP examination and students who completed the AP examination but did not complete the AP course in the same subject area were not included. Students could only count once as a percentage of the total population within a high school.

Additionally, AP performance was determined by the percentage of students within a school who completed at least one AP course and AP examination in the same subject area and received a score of 3, 4, or 5 on at least one AP examination. Students could only count once as a percentage of the total population within a high school.

Research Questions

This study was guided by the following research questions:

1. What relationship existed, if any, between the percentage of students within a high school who participated in the Advanced Placement (AP) program (defined by completion of at least one AP course and completion of AP test in

the same subject area) and the school-wide student achievement of a high school (defined by the 2008 Florida school grading system points)?

2. What relationship existed, if any, between the percentage of students within a school who successfully performed in the Advanced Placement (AP) program (defined as completion of at least one AP course and AP exam in the same subject area and a score of 3, 4 or 5 on the AP exam) and the school-wide student achievement of a high school (defined by the 2008 Florida school grading system points)?

Definition of Terms

For the purpose of this study, the following definitions were utilized to clarify terminology:

The Advanced Placement (AP) Program--This program offers students the opportunity to take college-level course work while in high school and to earn college credit by taking the corresponding end-of-course AP examination. There are presently 37 AP examinations in 22 subject areas including new courses, AP Chinese Language and Culture and AP Japanese Language and Culture (The College Board, 2006).

The College Board--This not-for-profit organization was originally called the College Entrance Exam Board and has been a cooperative endeavor between secondary schools and higher education institutions. The College Board organizes and oversees such programs and academic exams as the AP Program, the Preliminary Scholastic Aptitude test (PSAT) and the Scholastic Aptitude test (SAT) (The College Board, 2006).

The Elementary and Secondary Act of 1965 (ESEA)--ESEA was a legislative effort by the U.S. Congress to improve public education. Passed in 1965, the primary focus was inequities that exist within the public school sector. This later became the No Child Left Behind (NCLB) federal legislation (Kantor, 1991).

The Florida Partnership--This is a state-funded partnership with the College Board to improve minority achievement and participation in AP courses. It was established in 2000 by Florida Legislators during Jeb Bush's tenure as governor (Florida Department of Education, 2006).

National Assessment of Educational Progress (NAEP)-- NAEP is a national assessment which collects student performance data in reading and mathematics (Bracey, 2002).

The No Child Left Behind Act of 2001 (NCLB)--NCLB established a standards-based reform model with the goal of every student achieving proficiency in each major academic area by the 2013-2014 school year (Electronic Summary of the No Child Left Behind Act, 2001).

Study Design

Population

There were 347 public high schools (grades 9-12) in the state of Florida in the 2007-2008 school year who were included in the study. All of these high schools were graded by the Florida Department of Education in the 2007-2008 school year. There were

31 charter high schools in the 2007-2008 school year that were not included in the study because these schools typically lacked all of the grade levels of the 9-12 public high schools. There were 49 combination high schools in the state of Florida in the 2007-2008 school year that were not included in this study because they contained various grade levels including 6th grade, 7th grade and 8th grade students, and their grading system was different from the 347 public high schools (grades 9-12). It should be noted that there were 367 public high schools (grades 9-12) in the state of Florida in the 2007-2008 school year that were not combination schools or charter schools. Further investigation of these schools revealed that there were 20 high schools that had been inappropriately designated as high schools by the Florida DOE, or these schools had inconsistent data. One of these schools was a school for 9th graders only and another was a technical school for only 11th and 12th grade students. These two schools were removed from the data set because they did not serve grades 9-12 even though they were listed as such by the Florida Department of Education. The other 18 schools had inconsistent data, i.e., data derived from the FDOE did not match College Board data. Once these 20 schools were removed from the study, the final number of schools involved in the study was 347 public high schools (grades 9-12) from the 2007-2008 school year.

Instrumentation

The researcher collected the 2007-2008 school grade point data for the 347 Florida public high schools (grades 9-12) from the Florida Department of Education (FDOE) website (www.fldoe.org). As part of the requirements of the federal No Child

Left Behind (NCLB) legislation, the state of Florida was forced to create a standardized assessment and an accountability system for public schools in the state. The assessment used to track student progress in the state of Florida by the FDOE in the 2007-2008 school year was the Florida Comprehensive Assessment Test (FCAT). Individual students were assessed on the FCAT in four areas: Reading, Math, Writing, and Science. These individual scores were accumulated to create school grade points used by the FDOE to assign each public school in the state of Florida a grade of "A, B, C, D, or F" for each school year.

In an effort to further understand the performance of high schools in the state of Florida, the FDOE began to track AP student participation and AP student performance for each high school in the 1999-2000 school year along with other variables such as dual enrollment participation. The researcher collected data on AP student performance and AP student participation from two sources: the College Board and the FDOE. Data were accessed from the FDOE website (www.fldoe.org) and the national College Board website (www.collegeboard.com).

Reliability and Validity

The state of Florida DOE had to insure that the FCAT and school grading process met the reliability, validity, and accuracy standards set by the federal government in the NCLB legislation. The FCAT contained multiple-choice questions, short and extended response questions, and essay questions of an expository or persuasive nature. The design of the FCAT and its questions incorporated comprehensive quality standards and controls

to insure that the appropriate reliability and validity standards were met. Further information on the reliability and validity of the FCAT is available on the Florida DOE website (www.fldoe.org).

The College Entrance Examination Board, better known as the College Board, has been responsible for creating the Advanced Placement (AP) exams. According to College Board Vice President Trevor Packer, AP examinations have met the highest levels of testing for reliability and validity (2006). The College Board has instituted national protocols and standards that insure accuracy, reliability and validity. Further information on the reliability and validity of College Board's AP exams and results are available on the College Board website (www.collegeboard.com).

Data Collection

In July 2009, school grade points data were collected from the Florida Department of Education website on the 347 high schools from the 2007-2008 school year involved in this study. During the same period, information on each of the following variables was collected for the 347 high schools from the 2007-2008 school year involved in this study: school name, minority rate, free and reduced lunch rate, 2008 school grade points, 2008 AP student performance and 2008 AP student participation from the Florida Department of Education website and the College Board website. These data are presented in Appendix A.

The collected data were organized into a table and placed into an SPSS worksheet. These data were analyzed using several statistical procedures to answer the two research questions and any further investigative questions.

Data Analysis

For each of the 347 public high schools in the state of Florida in the 2007-2008 school year, the following 2008 demographic data were collected within the SPSS worksheet: (a) school name noted by a corresponding number; (b) minority rate in the school as defined by the percentage of students who were non-white; (c) free and reduced lunch rate as defined by the percentage of students who qualified for federal assistance in the form of free or reduced lunch based on household income from the previous year; (d) 2008 school grade points as defined by the Florida Department of Education (FDOE) school grade system; (e) 2008 AP performance as defined by the percentage of students within a school who completed at least on AP course and AP exam in the same subject area and scored a 3, 4, or 5 on the AP exam; (f) 2008 AP participation rate as defined by the percentage of students within a school who completed at least one AP course and AP exam in the same subject area.

Assumptions

The first assumption was that the data collected from the Florida Department of Education regarding school name and school grade points were accurate and reliable. The second assumption was that the data collected from the Florida Department of Education

and the College Board regarding school name, minority rate, free and reduced lunch rate, AP student performance and AP student participation were accurate and reliable.

Delimitations and Limitations

The following study was delimited to public high schools (grades 9-12) in Florida in 2008 (N = 347). The study was limited to the data provided by the Florida Department of Education and the College Board.

Significance of the Study

There has been an assumption by local, state, and federal politicians and superintendents that the more AP courses a school offers, the higher the school-wide student achievement. This research was conducted to determine if this was an accurate assumption. Many members of the general public and media have not understood the value of an AP course beyond college credit and college preparation for the AP student. The results of this study could be helpful to school leaders and legislators in their programmatic decisions made in regard to AP programs. Through these results, these leaders can understand the impact of this program beyond students who take AP courses, and they can make better informed decisions in their quest to improve school-wide student achievement.

CHAPTER 2
REVIEW OF LITERATURE

Introduction

This chapter has been organized to provide a review of the literature related to the historical development of the Advanced Placement (AP) program and state and national initiatives to expand the program. Literature and research related to criticisms, minority involvement, the future of the program and principals' perspectives are also presented. Finally, the Florida accountability system is explained to provide background regarding the measurement of achievement in Florida schools.

Historical Development of the Advanced Placement Program

In 1906, The Carnegie Foundation for the Advancement of Teaching created a system of academic units that would be required for entrance into college (Carnegie, 1971). A national system in the early 20th century developed with 12 years of elementary and secondary school (not including kindergarten) necessary for entrance to college. In 1929, when Robert Hutchins became the president of the University of Chicago, a new option emerged (Maeroff, 1983). Hutchins believed certain high school students were capable of early admission to college, and he created a system where high school students could be accepted to the University of Chicago for early admission during their junior or senior year in high school if they passed a series of competency exams (Maeroff). Other colleges and universities did not follow suit, and many felt these efforts by Hutchins "cheapened" the integrity of the high school-college relationship (Doxey, 1980, p. 13).

In 1951, the Ford Foundation created the Fund for the Advancement of Education whose purpose was to support the transition from high school to college (Whitlock, 1978). This organization found that certain high school students were capable of college work, and they funded an effort for over 400 high school juniors to enter college 2 years early at 11 different colleges and universities (Fund for the Advancement of Education, 1957). The younger students showed that they could compete with their older counterparts, and the results supported the efforts of the Fund for the Advancement of Education.

Partly as a result of these outcomes, the College Entrance Examination Board, otherwise known as the College Board, developed a group of courses where high school students could take college-level courses while in high school. This program was called the Advanced Placement (AP) program, and the first few courses of AP English and AP Calculus were offered in 1956 to a small number of high school students across the country (College Board, 2006).

A year later, in 1957, the Russians launched *Sputnik*, a man-made satellite, and the American media, legislators, and general public lashed out at the public educational system (Bracey, 2002). The general idea was that the Russians must have a superior educational system if they were able to beat the Americans to spaceflight. In his book, *Education and Freedom*, Vice Admiral Rickover called the public schools "the greatest cultural lag we have" (Rickover, 1959, p. 23). Politicians piled on by stating that public schools were not preparing students appropriately in the areas of math and science.

In 1965, Congress passed the Elementary and Secondary Act (ESEA). The purpose of ESEA was to pressure states into reforming their efforts and taking on the recommendations of the federal government through funding (Kantor, 1991). ESEA established a series of programs which funded opportunities for minority or low-income high school students to experience higher education. Upward Bound was one of the programs within these efforts which targeted first-generation college students (Covarrubias, 1989). The Advanced Placement (AP) program was emphasized as a way for these students to get exposure to college-level courses.

With the passing of ESEA, criticism of the public education system did not go away. Whitlock (1978) questioned the structure of the present high school-college system based on the existence of repetition in courses between high school and college. "People learn at different rates. . . .It seems strange, therefore, that education systems, supposedly dedicated to providing the best education for all students, are so structured that they block those differences" (Whitlock, p. 4).

In 1983, A Nation at Risk was released by the National Commission on Excellence in Education. This "paper sputnik" pointed to declining scores on the National Assessment of Educational Progress (NAEP) as evidence of the lack of a quality public school system (Bracey, 2002, p. 41). This report focused on the direction of the public schools in some of the following areas: the performance of American schools and colleges in relationship to other advanced nations and the quality of teaching and learning in schools (Electronic Summary of *A Nation at Risk*, 2001). The report did identify the

AP Program as a recommended educational program for high school students who want to succeed in college.

Wilbur, Lambert, and Young (1988) found that accelerated programs for high school students like the AP Program "smooth the transition from high school to college. . .expand the range of academic options for students, reduce curriculum duplication and credit transfer difficulties, encourage acceleration and address the needs of special groups" (p. 29). In 1989, President George H.W. Bush convened the nation's governors at an educational summit to determine ways to improve American public schools. This led to the reauthorization of ESEA in 1994 under then President Bill Clinton (Rudalevige, 2003). As each president attempted to improve public education in America in the 1980s and 1990s, the AP Program was continually cited as an example of what works in the U.S. Educational system.

On January 8, 2002, the No Child Left Behind Act (NCLB) was signed into law by President George W. Bush (National Conference of State Legislators, 2004). NCLB set up a standards-based reform model tied to federal funding designed to "have every student achieving at a proficient level, as defined by each state, by the 2013-2014 school year" (Electronic Summary of the No Child Left Behind Act, p. 1, 2001). Swanson and Stevenson (2002) stated that the public school reform efforts of the 1970s and 1980s were unsuccessful because the federal policies had no connection to the classroom, while, standards-based reform, as defined by NCLB, could lead to a connection between federal policy and the classroom and eventually, improvement of instruction.

The National and State Push for Advanced Placement (AP) Expansion

According to Gonzalez (2004), the AP program

> attracts the interests of a wide range of stakeholders, each with their own objectives and expectations. Any discussion of the AP program requires negotiating the varying interests of these stakeholders, including the College Board, the Educational Testing Service (ETS), which develops and administers the AP exams, as well as students, parents, high school teachers and administrators, college administration and faculty, individual college departments and political bodies that govern education. (pp. 1-2)

In his State of the Union address on January 31, 2005, President George W. Bush called for the training of 70,000 high school teachers over five years for Advanced Placement science and math courses. In a February 2005 presidential address, he urged Congress to pass a $1.5 billion high school intervention initiative (Spellings, 2005). One of the primary components of this initiative was to encourage more students to take AP courses "to prepare for the rigors of college" (Spellings, p. 20). According to Education Secretary Spellings, "This proposal for college preparation programs gives principals and school administrators the flexibility to use federal money to meet their unique needs for AP" (p. 21).

Since 1998, Florida legislators have created several initiatives regarding Advanced Placement. Unlike many states, Florida had, through a system of weighted FTE funding, rewarded school districts based on the number of students that score at level three or higher on AP exams. This funding had allowed school districts to award bonuses to AP teachers, up to a maximum of $2,000, based on the number of students who score at level three or above ($50 per student). According to the Florida Department of Education**,** about 70% of the AP weighted FTE funding has been returned to the school

level. This had enabled principals to fund teacher training, AP textbooks, AP resources and AP coordinator positions (2006). In the 2005 National Governor's Association (NGA) Initiative (*Redesigning the American High School: Getting it Done)*, the State of Florida was featured for its legislative policies regarding AP. The Association stated that

> between 1999 and 2003, nearly one in five public school students in Florida's high school class of 2004 left high school more prepared for college, having earned a score of three or higher on the AP exam. Florida achieved the largest expansion of any state in the nation in the proportion of students succeeding on an AP exam in high school. African-American students' participation has increased 133%, and Hispanic students' participation increased 138% since 1999. (NGA, 2005, p. 9)

In his first year as Florida's governor, Jeb Bush, signed legislation to create "The Florida Partnership," a state-funded partnership with the College Board to promote minority participation and success in AP courses. Florida legislators passed this initiative in 2000. Governor Bush praised the program in the following February 7, 2006 press release: "Thanks to our partnership with the College Board, more students than ever before have had access to higher education in high school," (Florida Department of Education, 2006, p. 1). Governor Bush continued,

> We're seeing proof that Florida's move toward more rigorous coursework is paying off. I salute the teachers who are encouraging the expansion of these programs into new schools, offering new academic opportunities to students who previously would not have the ability to get a jumpstart on their college careers. (Florida Department of Education, 2006, p. 1)

President Gaston Caperton of the College Board also commented on the success of the Florida Partnership:

> Governor Jeb Bush and the Florida Legislature's strong commitment to increase access in AP courses continue to pay off. Florida is among the top ten states in the country in graduating students with AP scores of three or more, and therefore,

> more Florida students than ever are being prepared to succeed in college. (2006, p. 12)

In a study of over 200,000 students, Dodd and Hargrove (2008) found that students who score at a three or higher on at least one AP exam "significantly outperformed" their non-AP peers (p. 8). Dodd and Hargrove looked at students at several different Texas universities and used academic ability and socio-economic background as a way to fairly compare non-AP and AP students. Dodd and Hargrove stated in a University of Texas press release,

> Even if an AP student scores two out of five points on an AP test – and most universities require at least a score of three – they still tend to do better in college than students who don't take AP courses or who skip the AP exam. (Dodd & Hargrove, 2008, p. 1)

High School students typically had choices in the way that they would be able to obtain college credit while in high school. Depending on the high school, students may have had the opportunity to take certain courses in a dual enrollment program with a local college or university. Students may also have had the option to take AP or International Baccalaureate (IB) classes which required a certain score on a standardized end-of-the-course exam to obtain college credit at most colleges and universities. The difference between dual enrollment and AP/IB is that students in dual enrollment have not had a standardized, end-of-the-course exam which determined whether the student would receive college credit. In dual enrollment, college credit would be awarded based on the final grade in the class. In AP, a student could obtain a final grade of "A" in the course but score a two on the exam and not receive college credit. Dodd and Hargrove (2008) found that AP students tended to perform better than their dual enrollment counterparts of

similar ability once in college. In a longitudinal study of college performance by AP students, Chamberlain (1978) suggested that the critical reading and writing found in AP courses prepare students for success in college English and social studies courses. It should be noted, however, that Chamberlain's study occurred prior to the dramatic expansion of AP courses across the country.

Criticism of the AP Program

The AP program has had its critics. In a University of California study, two Berkeley professors, Geiser & Santileces (2004), found that the number of AP courses had little or no relationship to the performance of college freshmen. The authors recommended that selective colleges should reconsider their use of AP enrollment as a definitive way to determine college admissions (Geiser & Santileces). In 2002, a committee of the National Research Council, part of the National Academy of Sciences, sharply criticized AP math and science courses for "cramming in too much material at the expense of understanding" and "failing to keep up with the developments in the subjects" (Lewin, 2006, p. 18). According to the 2002 report, AP courses did not provide enough opportunities for students to debate ideas, and analyze and solve problems. The committee reported that AP math and science courses "should focus on helping students acquire in-depth understanding rather than the more superficial knowledge that comes from covering too much material too quickly" (Lewin, p. 18). Gonzalez (2004) subsequently commented on the AP program and his belief that though it "has long had both its supporters and critics, recent efforts by the College Board to dramatically expand

the program has raised significant concerns about the outcomes of the program and the level of achievement actually indicated by the AP scores. (p. 2)"

In 2006, on the 50th anniversary of the Advanced Placement (AP) Program, the College Board, a nonprofit membership of universities, colleges and high schools, released the second annual *Advanced Placement Report to the Nation* ("the *Report*"), (2006). In this report, College Board President Caperton commented once again on AP, "Participation in AP has remarkable benefits for students; most notably, AP math and science courses are enabling American students to develop a level of math and science expertise that exceeds that of students from all other nations" (The College Board, 2006, p. 2).

Some critics have questioned whether AP courses have the necessary depth for students to fully understand the issues. A presentation by Sadler (2006), a senior lecturer in the Harvard Astronomy Department at an American Association for the Advancement of Science National Conference, generated debate on the credibility of Advanced Placement courses, at least in the sciences. Though classes were supposed to provide college-level work for high school students to give them an edge in college admissions, Sadler found that students who scored high on the exams in biology, chemistry, and physics did not earn significantly better college grades than students who never took the advanced classes. Sadler also addressed the issue of students' skipping key introductory courses when they entered the university. He attempted to show that this may not be ideal because students need to make sure they have the fundamentals of each of these courses in order to be successful in upper level courses. He stated, "They're certainly not as

powerful as many people think they are. Kids (students) who skip the courses (at the college level) could be missing out" (p. 24).

Minority Participation in AP

Despite the criticism of AP courses, federal, state and local legislators, school boards, superintendents, school officials and other sources have continued to pressure high school leaders to expand AP offerings. The Gates Millennium Scholars Program was founded, "to ensure that talent and energy meet with opportunity for thousands of promising minority students who want to go to college" (Noguera, 2004, p. 27). According to Gates (as cited in Noguera, 2004), about one-third of the nation's students graduate from high school ready for college, work, and citizenship.

> The other two-thirds, most of them low-income and minority students, are tracked into courses that won't ever get them ready for college or prepare them for a family-wage job--no matter how well the students learn or the teachers teach. . . once we realize that we are keeping low-income and minority kids out of rigorous courses, there can be only two arguments for keeping it that way--either we think they can't learn, or we think they're not worth teaching. The first argument is factually wrong; the second is morally wrong. (Noguera, p.28)

Superintendents, teachers, and principals in many urban schools talk about how the AP program exposes students to new subjects such as economics and psychology. They say AP courses help identify opportunities for those who might not otherwise think of themselves as college material. AP can help solve discipline problems when bored students with ability are placed in classes with higher achievers. Even students who score a two on the exam, or never even take the exam, benefit from having challenged themselves. Dickens (2006), Florida state economic advisor, proudly stated

> Racial diversity is a basic ingredient in the development of social capital. Black, Hispanic, and women businesses have increased by 71 percent, 38 percent and 29 percent, respectively, since 1997. Record numbers of Florida students took the SAT and AP exams, with an increase in minority test takers. More than 93,500 of Florida's high school graduates took the SAT, representing 65 percent of the total number of high-school graduates. In addition, Florida has the second greatest increase in public school AP exam-takers when compared to all other states from 2004 to 2005. These highlights demonstrate that Florida has moved beyond the rhetoric of education reform. In addition to these marked improvements, the governor has announced his intention to seek more rigorous learning goals for the high school students (A++ Plan). Higher standards translate into better human capital and earnings capacity. (Dickens, p. 24)

An Oregon teacher asked his own students the following question: "Why do so few low-income, minority students go to college? Interestingly, the most common answer was the same single word: money. Powell, in reflecting on his student responses, queried, "If high schools need serious revamping, could money be the key limiting factor?" (Pacetti, 2006. p. 23).

As superintendents, principals, guidance counselors, and teachers consider expanding the AP Program, it has been critical that each consider the positive and negative implications of Advanced Placement (AP) courses on school-wide student achievement. Lewin (2006) posed questions regarding the value of the Advanced Placement program. He inquired as to whether AP "levels the playing field and enriches the curriculum or does it feed the admissions frenzy and hijack the curriculum?" (Lewin, 2006, p. 17). When considering these issues, it is vital that one gains the perspective of all the groups involved: the perspective of superintendents and high school principals, guidance counselors, and teachers, of high school students taking AP classes and of

former AP students in college, of college admissions officers and college professors, and of various educational organizations and organizations that fund education.

The writers and editors of the 2006 College Board *Report* elicited commentary and questions from leading educational scholars and practitioners on the subject of AP and student achievement. "Why should your ability to access a quality, academic course be bound by where you live in our community or county? APs are not for the elite, they're for the prepared. And it's our job to prepare these kids," stated Dr. Terry Grier, Superintendent of Guilford County School District in North Carolina (College Board, 2006, p. 27). Grier's statement was supported by Scott Pfeifer, Principal of Centennial High School: "Unequivocally, I think they are a good thing. I believe any child who is going to college should try one AP course" (College Board, 2006, p. 28). According to former high school principal, Rick Dufour,

> It is a common misconception to think that certain students cannot succeed in Advanced Placement (AP) courses because they are not gifted or highly academic. But, the reality is I have seen average students be successful in AP courses based on work ethic and interest in the course. We are operating in the wrong frame of mind if we create barriers for entry to these courses. (College Board, 2006, p. 28)

Dickey (1986) found that AP students who were exempted from the college introductory course in calculus actually scored at a higher level than students who took the introductory calculus course on a common end-of-course assessment.

The 2006 *Report* also acknowledged criticism of the AP Program. College professors noted that former AP students sometimes struggle in college because they might have been too young to learn college-level material in high school or possibly their

teachers were not well-trained. A Boston University chemistry professor cited his concern, "There's significantly less depth" (College Board, 2006, p. 41), that AP classes are too focused on learning a battery of facts to pass the AP exam rather than tackling fewer subjects in-depth in a research paper. An admissions dean at the University of Pennsylvania, advocated for not seeing students place too much emphasis on AP courses to the exclusion of other things in his comment, "We are saying, 'Don't overstress yourself, but make sure you have some exposure to AP" (p. 41). As more students enter college having taken multiple AP classes, the most selective colleges are giving fewer students college credit. Therefore, students are not guaranteed that they will save time or money by taking AP classes. The University of Pennsylvania reported that only students who earned five on the exams would be awarded college credit at the university.

Packer expressed concern for all students,

> It's really important that we not give students in traditionally underserved schools a watered-down version of AP. This is a massive outreach effort to help even the playing field. Among those who take AP exams, 10% of students in urban schools score three or higher, compared to 60% of students in suburban high schools. (College Board, 2006, p. 22)

College Board officials have expressed the belief that Advanced Placement (AP) courses can be used to close the achievement gap between minorities and students of poverty and high achieving students. By opening up access to these courses, minority and free and reduced lunch qualifying students can be exposed to these rigorous courses and increase their chances of future success in college. Data released by the College Board in the *Report* (2006) indicated that students who take an AP course in their high school experience increase their chances of graduating from college in 4 years by 30%

regardless of the score on the AP test. *New York Times* reporter Tawar Lewin (2006) stated the following about the disparities between the classes:

> One of the most troubling aspects of the American education has long been an intractable achievement gap, with white students outpacing blacks in academic performance, a disparity reflected--and many say, caused--by ability-grouping systems that cluster white students in honors classes and minorities at lower levels. Advanced Placement classes have traditionally been viewed as part of the problem, but with an open-door policy, some educators say, they can be part of the solution. For students in urban high schools, the AP courses can provide an opportunity for advanced study that they would probably not have otherwise. (p. 18)

Despite increased diversity in the AP classroom, African American students have remained significantly underrepresented in AP classrooms. Nationwide, African American students made up 13.4% of the student population, but comprised only 6.4% of AP exam takers, according to the 2006 *Report*. Hispanic students, however, were well represented in AP classrooms nationally (13.4% of the student population and 13.6% of AP examinees). Although Hispanic students remained underrepresented in AP programs in many states, Florida and Maryland were noted in the report for the fact that in 2005, Hispanic student representation in AP courses was larger than the student Hispanic representation over-all (*Report*).

The *Report* (2006) stated that despite the strides that have been made by educators to provide traditionally underrepresented students with AP courses, lower performances on AP exams have indicated that many high-potential students and their teachers are not receiving adequate preparation for the rigors of an AP course. As a result, traditionally underrepresented students have continued to demonstrate significantly lower

performances on AP Exams. College Board President Caperton recommended the following:

> Major initiatives are needed to ensure that all students are adequately prepared starting in middle school so that students will have a fair shot at AP success when they reach high school. And just as important, as America's classrooms continue to diversify, new programs must be initiated to build schools' capacities to offer AP courses to all student populations, especially underserved minority students and young people from rural America. (College Board, 2006, p. 3)

Such initiatives, based in legislation designed to expand access to AP courses, have been successful in many states. In 2005, policy legislation in Arkansas resulted in record-breaking improvements in AP participation, particularly among traditionally underrepresented African American, Hispanic, and low-income students (The College Board, 2006). Beginning with the 2004-05 school year, Arkansas legislation mandated that all school districts provide AP courses in each of the four core areas of mathematics, English, science, and social studies (The College Board, 2006). Thereafter, districts have been required to add at least one core course each year. Arkansas has provided funding for the cost of the AP Exams for all students and has provided schools with professional development funds.

The results of the Arkansas initiative were (a) that the total number of students participating in AP has doubled, (b) the level of Hispanic and low-income participation has doubled, and (c) the level of African American student participation has tripled. Across the entire 50-year history of the AP Program, there have never been such large increases in participation achieved in a single year, particularly among traditionally underserved students (College Board, 2006).

The College Board attempted to provide better quality control. According to the 2006 *Report*, the AP Course Audit was "designed to ensure that each course labeled 'AP' provides students with the content knowledge and resources needed for them to have a successful, college-level experience while still in high school" (p. 23). In 2008, AP audited high schools for what was taught and provided colleges and universities with a list of schools they certified as meeting their standards. At the time of the present study, the College Board was planning to audit 15,000 high schools in 2009 to ensure that AP students everywhere received the same quality of curriculum.

The Future of the AP program

The AP Program has grown at a tremendous rate. From 1990 to 2000, the AP exam participation more than doubled nationwide. A total of 490,000 AP exams were administered in 1990, and over 1.2 million exams were given in 2000 (College Board, 2001). Table 1 displays data related to the increase in participation in the program (schools, students and examinations) between 1980 and 2000.

Table 1
Participation in the Advanced Placement (AP) Program: 1980-2000

Descriptor	1980	1990	2000
AP Students	119,918	330,080	768,586
AP Examinations	160,214	490,299	1,272,317
AP Schools	4,950	9,292	13,253

Source: College Board, "AP Exam Data: 2000"

Because of this growth, policymakers, educators, parents, and students have been led to consider the challenges associated with growth. In 2001, the College Board selected a group of national, state and local educational leaders to create a report on the future of the AP program. The group was called the "Commission on the Future of the Advanced Placement Program" and the theme was "Access to Excellence" (College Board, 2001). According to Co-Chairs Jenny Krugman and James Freedman,

> Much of AP's growth has been driven by outside influences. These include policymakers and supporters of education reform who view AP as a way to improve the quality of American education while at the same time providing new opportunities for students. For example, former United States Secretary of Education Richard Riley put forth the goal of offering AP in every school in the nation, with 10 courses in each school by 2010. The federal Advanced Placement Incentive Program provides funding to 41 states to support access to AP for low-income students. Finally, many states have established legislative support for AP, ranging from mandating that AP be offered in every high school, to supporting teacher professional development, to subsidizing AP Examination fees. (College Board, 2001, p. 3)

With significant growth came major challenges. Issues with the fidelity and integrity of the program were evident across the country as teachers, administrators and students struggled to build the infrastructure and support systems necessary for success in the AP course and the AP end-of-the-year exam. In the *Access to Excellence* Forum, stakeholders including College Board officials, university professors, superintendents, principals and teachers shared their views on issues in the key areas of equity and quality (2001, p. 3).

During the Forum, issues were discussed in regard to adding AP courses to the curriculum. Concerns were raised as to teachers being appropriately trained to teach AP courses. The College Board estimated that only 60-70% of the teachers teaching an AP

course in the 2000-2001 school year attended the AP week-long summer institute (2001). Another issue concerned whether students taking the AP course were actually taking the AP examinations. In the 2000-2001 school year, the College Board (2001) stated that 34% of students in AP courses did not sit for the exam (2001). One concern addressed the rigor of the course and whether it was sufficient to prepare the student for success on AP exams.

The question of access was also discussed. How students access AP courses was critical in determining student AP enrollment. Too many obstacles have often led to limited opportunities for lower socio-economic and minority students, while complete open access policies have led to a "watered-down" program that may not even resemble AP. On the issue of access to AP, Burton discussed the barriers that have often limited AP opportunities for minority and lower socio-economic students:

> The AP experience is valuable to any student planning to attend college, but are of even more importance to students without family experience of college attendance, without a 'book culture' at home, among peer groups who do not consider education a promising option for the future, or in schools not emphasizing college preparation. Students in minority groups traditionally underrepresented in college frequently experience one or more of these barriers. The chance (to take AP) is not equally available to all minority students because of varying practices in admission to the program. The chance is also not appropriate for all students, since AP courses are challenging even for well-prepared students. (Burton, 2002, p.1)

Barriers for students to take AP depend on the way that students access the courses. Burton's research has supported the concept that "open access" for all students to potentially take AP courses is not appropriate, practical, or the right thing to do for students. The Commission on the future of AP has reported that although minority AP

participation has grown, poor schools continue to lag in AP performance due to teacher training issues (2001). In the *Access to Excellence* Forum, the Commission cited the following disparities as they considered the future of the AP program and made recommendations for improving the quality of the AP experience while dealing with exceptional growth:

> The number of teachers qualified to teach AP courses is limited. Without vigorous recruitment and increased in-service training, there will not be enough qualified teachers to meet AP needs, particularly in underserved areas.
>
> The number of college and university faculty engaged with AP, especially full-time faculty from four-year institutions, is inadequate. Without strong efforts to recruit faculty into the critical work of validation studies, examination development, and reading and scoring examinations, quality will suffer.
>
> Growth demands greater resources in high schools to support AP instruction because schools will be subjected to increased pressure to administer greater numbers of AP courses and examinations to more students, severely taxing budgets for such resources. Growth raises questions for colleges and universities about the consequences of ever increasing numbers of students who may qualify for college credit or advanced placement. Some institutions are increasingly reluctant to grant large numbers of college credits to incoming AP students and have questioned whether the value of AP Examination grades has been maintained as the AP Program has become larger and more diverse. (College Board, 2001, p. 5)

The future of the AP program is dependent on maintaining the integrity of the program. If results show that the program is growing too fast and the quality is suffering, the integrity of the program could be compromised. Researchers have continued to show that students who take an AP course benefit from the rigor of the experience when they go to college. However, with unprecedented growth, how will schools have the resources and capacity to maintain the quality, integrity and rigor of the program? The College Board has referred to this question as the "equity and quality challenge" (2001, p. 6). The

Commission on the Future of the AP Program has addressed this issue with two questions: “How can the high quality of AP be maintained during a period of rapid growth? How can the existing educational inequities in student access to high-quality AP opportunities be diminished?” (2001, p. 1).

Clearly, one answer is teacher quality. Haycock (1998) studied standardized assessments and AP scores in several states and found that the best prepared teachers consistently showed better results. Those teachers that attended AP professional development and AP teacher training multiple times scored at a higher level according to Haycock. Experience has proven to be a major factor in AP results, but understanding how to teach all students including poor and minority students has been an important factor in success. As the AP program has continued to grow and more diverse students have become involved in the program, it has been critical for teachers to meet their needs. According to McCall (1999), a comprehensive set of interventions by teachers are necessary for underrepresented, underprepared students to achieve on a consistent basis.

The College Board accepts the fact that AP will continue to grow “because of a combination of political, social and educational forces, but, without strategies to manage growth, inequities could be exacerbated and quality eroded” (2001, p. 7). To deal with these challenges, the commission on the future of AP made recommendations in their report in regard to AP access, AP quality, and appropriate use of AP teacher support, school support and curriculum. Building capacity in each of these areas has been a tremendous challenge as there are only so many quality AP teachers with significant AP

experience. Some of the recommendations made by the commission include the following:

1. Advance the expansion of AP in underserved schools.
2. Strengthen the preparation of students in the grades prior to AP, with an emphasis on professional development and the development and implementation of curriculum standards for elementary and middle schools.
3. Provide unconditional support for preparing teachers, schools and school systems to offer high-quality AP programs.
4. Expand and enhance direct support for teachers.
5. Develop creative partnerships and tools to enhance professional development. (College Board, 2001, p. 8)

When these recommendations were made to the College Board in 2001 by the Commission on the future of AP, certain steps were taken to meet these recommendations. The College Board created: (a) AP Central, an on-line support site for AP teachers; (b) AP audits of AP courses to insure that the course was a real AP course; (c) Varying professional development for Pre-AP courses and middle school courses; and (d) The Springboard program, a 6-12 curriculum framework for Language Arts and Math courses (2009). Many of the same disparities mentioned in the commission report in 2000 continued at the time the present study was initiated. The AP program has continued to grow rapidly across the country as federal, state and local political and educational leaders promote AP as a way to improve schools. The challenges of unprecedented growth and limited capacity continued to threaten program quality.

The Principal's View of AP

One other significant issue mentioned by principals in the *Report* was that student achievement on standardized tests like the SAT and FCAT improved school-wide when

student enrollment in AP courses increased. During one principal's tenure in a New York high school, which was one of the first schools to incorporate inclusion strategies, the percentage of students taking AP or International Baccalaureate (IB) courses increased from 5% to 70% (Noguera, 2004). The school recorded increased state assessment scores and national standardized scores every year despite significant challenges from a high language-minority population.

Ranked as the top public high school in the country by several different groups and publications, Adlai Stevenson High School in northern suburban Chicago has been a beacon of high student achievement by all students. Of the 4,500 students enrolled, 75% take at least one AP course. One former principal spoke of the school's 1986 paradigm shift (Noguera, 2004).

> We went from 'all students are taught and given an opportunity to learn' to 'All students should learn.' It is one thing to say it and another to actually do it. And we made the transformation. The keys for us were greater clarity regarding the interpretation of standards, greater consistency regarding the importance of different standards, common assessments, common pacing, common interventions and greater ownership and commitment to standards. . . . The beauty of the AP Program is it gives you national standards and consistency. (Noguera, p. 30)

The Florida Accountability System

The State of Florida's educational accountability system has developed into a system lauded by educational organizations such as the Manhattan Institute for being an accurate reflection of student achievement (Postal, 2003.) This system has been based primarily on a state standardized test called the Florida Comprehensive Achievement Test, better known as the FCAT.

In the Educational Accountability Act of 1971 (Section 229.57, Florida Statutes), Florida legislators spelled out the responsibilities of the state of Florida Department of Education (FDOE) for creating and establishing a statewide system of educational accountability. The FDOE was required to:

> (a) Establish basic, specific, uniform statewide educational objectives for each grade level and subject area, including, but not limited to, reading, mathematics and writing, and (b) develop and administrate a uniform and regularly administered statewide assessment to determine pupil status, pupil progress, and the degree to which pupils had achieved established educational objectives. (FDOE, 2009, p. 2)

The first assessment used by the FDOE was called the State Student Assessment Test (SSAT) and was administered in reading, writing, and math to sample groups across the state at the 3rd, 6th and 9th grade level in 1972 (2009). The SSAT was used to gather representative samples for state and local studies, but data were not released at the school level or the individual student level according to the FDOE (2009). Once the FDOE understood that school and individual student data were necessary, the Educational Accountability Act was amended to require the assessment of all students in reading, mathematics, and writing by 1976 (FDOE, 2009).

With the 1976 amendment, legislators also created the first-ever state graduation test for high school students in Florida. This assessment measured the literacy level of 11th grade students and was named the State Student Assessment Test, Part II (FDOE, 2009). In 1984, this SSAT-II morphed into the High School Competency Test (HSCT). In 1991, the Florida Commission on Education Reform and Accountability released *Blueprint 2000*, a report containing potential major changes in the accountability system.

Blueprint 2000 included a Florida Comprehensive Assessment Design (FCAD) which was the "formal development of a new statewide assessment system as part of an overall strategy to increase student achievement. . .which would be called the Florida Comprehensive Assessment Test (FCAT)" (FDOE, 2009). At this time, Florida created benchmarks in each academic area called the Sunshine State Standards. These benchmarks covered the three areas of the FCAT assessment: Reading, Math and Writing. The first FCAT was field tested in 1997 and was ready to be used statewide in 1998 (FDOE, 2009). The FCAT became the primary measure of students' achievement of the Sunshine State Standards, and student scores were classified into five achievement levels, with 1 being the lowest and 5 being the highest (FDOE, 2009).

In 1998, Republican Jeb Bush became Governor of the state of Florida and announced that his top issue would be education and "improving student achievement and ensuring that children receive a quality education" (FDOE, 2001, p. 1). Within his first year, he advocated and oversaw the passage of educational reform legislation called the A+ plan. This plan would mandate that all public schools in the state of Florida would receive a letter grade based on the schools' student achievement on the FCAT. In order to make this happen, the A+ plan expanded the FCAT for each grade level from 3rd grade through 10th grade. Furthermore, the plan was "built upon two principles: (a) each student should gain a year's worth of knowledge in a year's time in a Florida Public school, and (b) no student should be left behind" (FDOE, 2001, p.2). The FCAT would not only be used to grade schools, but also to determine if a student would graduate from high school and whether or not a third grade student would be promoted to fourth grade.

As the FCAT expanded and became the basis of school grades, the assessment came under scrutiny from various educational groups, parents, and students. Some questioned the fairness of one assessment determining whether or not students graduated from high school or were promoted from third grade. Others complained about the inequities of assigning grades to individual schools of varying demographics. Despite such scrutiny and criticisms, the FDOE continued to use the FCAT as a measurement tool, and over time the assessment was recognized as a quality measurement tool of student ability by various educational organizations like the Manhattan Institute. The Manhattan Institute, an educational think tank, studied the FCAT and determined that it was a fair measure of student achievement in a 2003 study (Greene & Winters, 2003). Greene and Winters compared student scores on the FCAT with scores on the Stanford-9 test, a national assessment and found the scores of the FCAT closely aligned with scores on the Stanford-9 (2003). Greene stated the following in an article he wrote for *The Tampa Tribune*:

> Our findings suggest that if Florida teachers are focusing exclusively on FCAT material, as some claim, then in doing so they are teaching skills that are generally useful rather than useful only to pass a single standardized test. By forcing teachers to alter their curricula and teaching techniques in order to get their students to pass the FCAT, Florida has forced them to better prepare their students for life outside the classroom walls. The evidence suggests that the FCAT has effectively communicated to teachers and schools what general knowledge they must teach, and provided them with incentives to ensure that students acquire that knowledge. (2003, p. 1)

Audrey Amrien, Arizona State University professor, disputed the results of the Manhattan study, stating that high-stakes tests have not led to actual, measurable progress and have become an "easy way to control what's going on in the schools" (Postal, 2003,

p. 5). In her own studies, Amrien and Berliner (2002) has compared results on standardized tests like the FCAT with results on national assessments like the SAT or National Assessment of Education Progress (NAEP). In these studies, she has found that states have not paralleled their standardized test results with the national exams.

According to a Broward County public school district director, "I've always believed the test (FCAT) is a good measure, a valid measure. It's testing what we are trying to teach" (Harrison, 2003, p. 7). Even the teachers' union, the Florida Education Association (FEA), conceded that the FCAT was a well-structured assessment (Harrison, 2003). The association, however, has not supported the manner in which the FCAT has been used to grade schools. An FEA spokesman stated,

> Most everyone says the FCAT is a good test. That's uniform. The objection is that everything boils down to this one test. It might not catch all the improvement a student has done over the year. There are very good students who won't perform well. (Harrison, p. 7)

When the bipartisan legislation, No Child Left Behind (NCLB), was passed in 2001, the federal role in public education changed significantly. Annual Yearly Progress (AYP) became an expectation for all schools. NCLB mandated that all students show AYP on each area in their state assessments or risk losing federal funding (2001). In regard to measuring the progress of its students, the state of Florida had been proactive, and a school grading process was already in place to measure student growth in the areas of reading and mathematics. Starting in 1998, the FCAT was utilized as a way to grade elementary, middle, and high schools. Each school received a grade of "A, B, C, D or F" based on the FCAT student results for each school in the areas of Reading, Writing and

Math. Science was later added to this formula in 2005. In the 2007-2008 school year, eight areas of student performance on the FCAT were measured to determine the school grade: four in Performance (Reading, Writing, Math and Science) and four in Learning Gains or Growth (Reading, Math, Lower 25% Reading and Lower 25% Math).

According to the FDOE, Florida schools were assigned a letter grade based upon student achievement on the FCAT in the 2007-2008 school year, and school grades have been used to communicate to the public how well schools and their students are performing in learning the Sunshine State Standards (2009). School grades were computed by a point system from the FCAT student achievement in the areas of Reading, Math, Writing and Science. Schools were given a point for every percent of students within the school that score at a level of 3 or higher in Reading, Math and Science and 3.5 or higher in Writing. Schools were also given a point for every percent of students within the school that showed learning gains in Reading and Math. The maximum number of points in each area was 100 (signifying 100%); thus, the maximum number of points in the eight areas was 800 points.

Each of the schools in the state of Florida in the 2007-2008 school year received a total number of points in these eight areas, enabling the determination of the school's grade. For an "A" grade, schools needed to score at least 525 points in the eight areas. For a "B" grade, schools needed to score at least 495 points in the eight areas. For a "C" grade, schools needed to score at least 435 points in the eight areas. For a "D" grade, schools needed to score at least 395 points. Any schools that scored at 394 points were rated as an "F" graded school by the Florida Department of Education.

As displayed in Table 2, points were not the only aspect of the Florida School grade system. Schools must have met guidelines on testing a certain amount of students and the lowest 25% of student scores in Reading and Math have to be at a certain level or a school was penalized a letter grade. The Lower 25% is referring to the students coming into the school year with scores in Reading and Math rated in the lowest quartile in an individual school. This Lower 25% of the students was classified as "Meet Adequate Progress" noted in the table, not to be confused with Annual Yearly Progress (AYP), a federal requirement.

According to the FDOE, only "standard curriculum students (including Speech impaired, gifted, hospital/homebound, and limited English proficient students (LEP) with more than two years in an ESOL program) enrolled in the same school in both October and February were included in the components" used in determining the score of 3 or higher on FCAT (2009, p.10). However, all students, including students with learning disabilities or second language learners, were counted in the learning gains component of a school's grade calculation. The following statement summarizes the focus and intent of Florida's adoption and use of the FCAT:

> Accountability for student learning is the key focus of Florida's system of school improvement and results from the statewide assessment program are the basis of Florida's system of school improvement and accountability. Student achievement data from the FCAT are used to report educational status and annual progress for individual students, schools, districts, and the State. (FDOE, 2009, p.11)

Table 2
Florida Department of Education (FDOE) School Grade Points

School Grade	Requirements
A	525 points or more on school grade system Meet adequate progress of students in the lowest 25% in reading and math Test at least 95% of eligible students
B	495 points or more on school grade system Meet adequate progress of students in the lowest 25% in reading and math Test at least 90% of eligible students
C	435 points of more on school grade system Meet adequate progress of students in lowest 25% in reading and math
D	395 points or more on school grade system Test at least 90% of eligible students
F	Fewer than 395 points on school grade system

Source: Florida Department of Education. "School grade information: 2008."

Summary

Regardless of the merits of the criticism of the AP program or the state accountability system, both educational programs seem destined to thrive and grow in the state of Florida. The AP program, which began as an elite program catering to a few students, has become a mainstream high school program. On a federal, state and local level, legislators, school boards, superintendents and administrators have pressured high schools to increase their AP offerings, AP student participation and AP student performance. The rationale behind this initiative is that more AP course-taking will lead to more students in college and higher scores on state and national assessments.

In this literature review, the national and state push for AP expansion has been addressed along with the various criticisms of the AP program. Minority participation in AP has been considered from various angles along with a principal's view of AP and considerations for the future of the AP program. Adelman's research has provided support for the rigor found in AP courses serving as a predictor of college success. However, Geiser & Santileces (2004) and others have rejected this idea and have questioned whether AP really makes a difference in the future success of a student.

The Florida accountability system has also been discussed in this literature review to help the reader understand how school-wide student achievement has been determined in the state of Florida. As principals, administrators, guidance counselors and teachers make decisions related to AP, they must consider the value of AP to the whole school in terms of achievement. This involves considering the impact of AP on non-AP students and the impact of AP student participation and performance on school-wide student achievement. This study was designed to address these issues and to help schools understand the implications of the AP program for all students.

CHAPTER 3
METHODOLOGY

Introduction

This chapter has been organized to present the methodology and procedures used in conducting this study. It includes the following sections: (a) Statement of the Problem, (b) Purpose of the Study, (c) Population, (d) Research Questions, (e) Instrumentation for both student achievement and advanced placement data and their validity and reliability, and (f) Data Collection and Analysis.

Statement of the Problem

With a federal, state and local push to increase AP courses, schools have been challenged to consider the implications of such an increase. The benefits or non-benefits of AP to the AP student have been debated based on current research. However, there has been a lack of research on the benefits or non-benefits of AP to the non-AP student or the entire student body. Prior to this study, there had been no attempt to correlate (a) school-wide student achievement in a high school and AP student performance in a high school or (b) school-wide student achievement in a high school and AP student participation in a high school.

At the time of the present study, it was not known if there was a relationship between the percentage of students within a high school who take AP courses and AP exams and the school-wide student achievement in a high school. Similarly, whether

there was a correlation, positive or negative, between AP success and school-wide student achievement was unknown.

There has been an assumption by local, state, and federal politicians and superintendents that offering more AP courses would lead to higher school-wide student achievement. The accuracy of that assumption was investigated in this research. Many members of the general public and media do not understand the value of an AP course beyond college credit and college preparation for the AP student. The results of this study were intended to provide direction for school leaders and legislators as they make choices and policy about AP programs. Through these results, leaders can understand the impact of this program beyond the benefits to AP students. They can make better informed decisions in their quest for improving school-wide student achievement.

Purpose of the Study

The purpose of this study was to provide insight into the impact of the Advanced Placement (AP) program on school-wide student achievement and to investigate whether a "rippling effect" from students taking AP courses to non-AP students could serve as a vehicle to increase school-wide achievement. Thus, the researcher attempted to address the whole school's performance and not just the performance of the students taking AP courses and AP exams.

Population

There were 347 public high schools (grades 9-12) in the state of Florida in the 2007-2008 school year included in this study. These 347 high schools were all of the public high schools in the state of Florida that were graded by the Florida Department of Education in the 2007-2008 school year with the exception of charter high schools and combination high schools. It should be noted that there were 367 public high schools (grades 9-12) in the state of Florida in the 2007-2008 school year that were not combination schools or charter schools. Further investigation of these schools revealed that there were 20 high schools that had been inappropriately designated as high schools by the Florida DOE or these schools had inconsistent data. One of these schools was a school for 9th graders only and another was a technical school for only 11th and 12th grade students. These two schools were removed from the data set because they did not serve grades 9-12 even though they were listed as such by the Florida Department of Education. The other 18 schools had inconsistent data, i.e., data derived from the FDOE did not match College Board data. Once these 20 schools were removed from the study, the final number of schools involved in the study was 347 public high schools (grades 9-12) from the 2007-2008 school year. The 31 charter high schools in the 2007-2008 school year were not included in this study because these schools typically lacked all of the grade levels of the 9-12 public high schools. There were 49 combination high schools in the state of Florida in the 2007-2008 school year that were also excluded from the study because they contained various grade levels including 6th grade, 7th grade and 8th grade

students, and their grading system was different from that of the 347 public high schools (grades 9-12).

The 347 schools are represented by the following school districts in the state of Florida (listed alphabetically and by district): (1) Alachua; (3) Bay; (4) Bradford; (5) Brevard; (6) Broward; (8) Charlotte; (9) Citrus; (10) Clay; (11) Collier; (12) Columbia; (13) Dade; (14) Desoto; (15) Dixie; (16) Duval; (17) Escambia; (18) Flagler; (20) Gadsden; (23) Gulf; (25) Hardee; (26) Hendry; (27) Hernando; (28) Highlands; (29) Hillsborough; (30) Holmes; (31) Indian River; (32) Jackson; (35) Lake; (36) Lee; (37) Leon; (38) Levy; (39) Liberty; (40) Madison; (41) Manatee; (42) Marion; (43) Martin; (44) Monroe; (45) Nassau; (46) Okaloosa; (47) Okeechobee; (48) Orange; (49) Osceola; (50) Palm Beach; (51) Pasco; (52) Pinellas; (53) Polk; (54) Putnam; (55) St. Johns; (56) St. Lucie; (57) Santa Rosa; (58) Sarasota; (59) Seminole; (60) Sumter; (61) Suwannee; (62) Taylor; (63) Union; (64) Volusia; (65) Wakulla; (66) Walton; (67) Washington.

Research Questions

This study was guided by the following research questions:

1. What relationship existed, if any, between the percentage of students within a high school who participated in the Advanced Placement (AP) program (defined by completion of at least one AP course and completion of AP test in the same subject area) and the school-wide student achievement of a high school (defined by the 2008 Florida school grading system points)?

2. What relationship existed, if any, between the percentage of students within a high school who successfully performed in the Advanced Placement (AP) program (defined as completion of at least one AP course and AP exam in the same subject area and a score of 3, 4, or 5 on the AP exam) and the school-wide student achievement of a high school (defined by the 2008 Florida school grading system points)?

Sources of Data

Student Achievement Data

Each of the 347 high schools in the state of Florida in the 2007-2008 school year (which were all classified as public high schools containing students in 9th, 10th, 11th and 12th grade and not charter high schools or combination schools with 6th, 7th or 8th grade students) received a school grade from the Florida DOE. Therefore, each of the 347 high schools received a certain number of points from the eight areas of student performance on the FCAT. These point totals were used for this study to designate a school's school-wide student performance. It should be noted that there were 367 public high schools (grades 9-12) in the state of Florida in the 2007-2008 school year that were not combination schools or charter schools. Further investigation of these schools revealed that there were 20 high schools that had been inappropriately designated as high schools by the Florida DOE or these schools had inconsistent data. One of these schools was a school for 9th graders only and another was a technical school for only 11th and 12th

grade students. These two schools were removed from the data set because they did not serve grades 9-12 even though they were listed as such by the Florida Department of Education. The other 18 schools had inconsistent data, i.e., data derived from the FDOE did not match College Board data. Once these 20 schools were removed from the study, the final number of schools involved in the study was 347 public high schools (grades 9-12) from the 2007-2008 school year.

The researcher collected the school grade points data for 347 public high schools (grades 9-12) in the 2007-2008 school year in the state of Florida from the Florida Department of Education (DOE) website (www.fldoe.org). As part of the requirements of the federal No Child Left Behind (NCLB) legislation, the state of Florida was forced to create a standardized assessment and an accountability system for public schools in the state. The assessment used to track student progress in the state of Florida by the Florida DOE in the 2007-2008 school year was the Florida Comprehensive Assessment Test, better known as the FCAT. Individual students were assessed on the FCAT in four areas: Reading, Math, Writing and Science. These individual scores were accumulated to create school grade points used by the Florida DOE to assign each public school in the state of Florida a grade of "A, B, C, D or F" for each school year.

Advanced Placement Data

In an effort to further understand the performance of high schools in the state of Florida, the Florida DOE began to track performance of AP students in the 1999-2000 school year. Efforts were directed to tracking AP student participation and AP student

performance for each high school along with other variables including dual enrollment participation.

Data for the present study were released by the Florida DOE for each of the 347 high schools on AP student performance and AP student participation from the 2007-2008 school year in April of 2009. These data were released to the testing coordinators of each school district and shared with the stakeholders within the district including the school board, superintendent, school administrators, teachers, students, parents and community members. This official AP student participation and AP student performance data from the Florida DOE and the College Board was utilized for this study along with the school grade information which is available on the Florida DOE website.

AP participation, in this study, was determined by the number of students who completed at least one AP course and AP exam in the same subject area. Students were counted once, not multiple times, regardless of how many AP courses and AP exams were taken. AP participation was defined by students who completed the AP course in a subject area and the accompanying AP exam in the same subject area. Students who completed only the AP course and not the AP exam in the same subject area were excluded, and students who completed the AP exam and not the AP course in the same subject area were also excluded. Students were counted only once as a percentage of the total population within a high school. As an example, Student A, who completed one AP course and AP exam in the same subject area, was counted once for this study. Student B, who completed seven AP courses and seven AP exams in the same subject areas, was counted once in this study.

AP performance, in this study, was determined by the percentage of students within a school who completed at least one AP course and AP exam in the same subject area and received a score of 3, 4 or 5 on at least one AP exam. Students were only counted once as a percentage of the total population within a high school. For example, if Student A completed seven AP courses and seven AP exams in the respective subject areas and received a score of 3 on one of the AP exams, Student A was counted once for this study. Student B, who completed seven AP courses and seven AP exams and scored at a level of 3 or higher on all seven exams, was also counted once for the study. Student C, who completed no AP courses, but took an AP exam and scored a level of 5 on the exam, did not count for this study.

The researcher collected the data on AP student performance and AP student participation from two sources: the College Board and the Florida Department of Education. The data were available on the Florida Department of Education website, www.fldoe.org and the national College Board website, www.collegeboard.com.

Instrument Reliability and Validity

Florida Comprehensive Assessment Test (FCAT)

As part of the requirements of the federal No Child Left Behind (NCLB) legislation, the state of Florida was forced to create a standardized assessment and an accountability system for public schools in the state. The assessment used to track student progress in the state of Florida by the Florida DOE in the 2007-2008 school year was the

Florida Comprehensive Assessment Test, better known as the FCAT. Individual students were assessed on the FCAT in four areas: Reading, Math, Writing, and Science. These individual scores were accumulated to create school grade points used by the Florida DOE to assign each public school in the state of Florida a letter grade of "A", "B", "C", "D" or "F" for each school year.

The state of Florida DOE had to insure that the FCAT and school grading process met the reliability, validity and accuracy standards set by the federal government in the NCLB legislation. The FCAT contains multiple-choice questions, short and extended response questions and essay questions of an expository or persuasive nature. The design of the FCAT and its questions incorporate comprehensive quality standards and controls to insure that the appropriate reliability and validity standards were met. Further information on the reliability and validity of the FCAT was available on the Florida DOE website, www.fldoe.org.

According to the Florida Department of Education, at the time of the present study, there were eight stages in the development of an FCAT item: (a) item writing; (b) pilot testing; (c) committee reviews; (d) field testing; (e) statistical review; (f) test construction; (g) operational testing; (h) item release or reuse (2009). Once the items have been processed, they become part of a test bank used for the actual FCAT. Items have been subjected to extensive quality assurance measures to insure instrument reliability and validity.

This test development process has been used to "minimize error and maximize the reliability of the FCAT" (FDOE, 2009, p. 24). While constructing the FCAT, test

developers reviewed the data item statistically and created three ways to insure overall test reliability: standard error of measurement (SEM), marginal reliability, and Cronbach's alpha (FDOE, 2009). Once the items have been reviewed using these measures, established test guidelines were considered before the items were finalized. After the test was administered, the same methods were reapplied to evaluate the effectiveness of the test.

Advanced Placement

The College Entrance Examination Board, better known as the College Board, has been responsible for creating Advanced Placement (AP) examinations. According to College Board Vice President Trevor Packer, AP exams meet the highest levels of testing for reliability and validity (2006). The College Board instituted national protocols and standards that insured accuracy, reliability and validity. Further information on the reliability and validity of College Board's Advanced Placement (AP) exams and results were available on the College Board website, www.collegeboard.com.

Data Collection and Analysis

In July 2009, school grade points data were collected on the 347 high schools from the 2007-2008 school year involved in this study from the Florida Department of Education website. Data on each of the 347 high schools from the 2007-2008 school year involved in this study were also collected on the following variables: school name, minority rate, free and reduced lunch rate, 2008 school grade points, 2008 AP student

performance and 2008 AP student participation from the Florida Department of Education website and the College Board website. School grade points and variable data for 2008 that were used in the study are included in Appendix A. After review by the Institutional Review Board of the University of Central Florida, and because only public data were used in the study, it was determined to be exempt from the review process (Appendix B).

The data that were collected for the 347 schools, organized in tabular form, and placed into an SPSS worksheet, were: (a) school name noted by a corresponding number, (b) minority rate in the school as defined by the percentage of students who were non-white, (c) free and reduced lunch rate as defined by the percentage of students who qualified for federal assistance in the form of free or reduced lunch based on household income from the previous year, (d) 2008 school grade points as defined by the Florida Department of Education (DOE) school grade system, (e) 2008 AP performance rate as defined by the percentage of AP tests within a school that were scored at a level of 3, 4 or 5,and (f) 2008 AP participation rate as defined by the number of students who took an AP class divided by the total number of students within a school.

Summary

This chapter has been organized to present the methodology and procedures used in conducting this study. The problem, purpose, population and research questions have been presented. Detailed information has been presented regarding sources of data

regarding both student achievement and advanced placement. Data collection and analysis procedures have also been discussed.

The variables were defined so as to determine if there were a relationship between AP student participation and school-wide student achievement. Furthermore, the researcher was able to examine the relationship between selected variables, i. e., minority rate, free and reduced lunch rate and school grade points, AP student performance and AP student participation. Chapter 4 presents a summary of the analysis of the data for the two research questions and associated variables.

CHAPTER 4
ANALYSIS OF DATA

Introduction

This chapter provides data analysis relevant to the two research questions of this study. It has been organized to briefly review the purpose of the study and to provide an overview of the design and methodology used in the data analysis. The results are presented using narrative discussion and tabular displays organized around the research questions.

Purpose of the Study

The intent of this study was to provide insight into the impact of the Advanced Placement (AP) program on school-wide student achievement. Two primary issues are considered: (a) the correlation between AP student participation in a high school and the school-wide student achievement of a high school as defined by the state's standardized test, and (b) the correlation between AP student performance (scores of 3, 4 or 5 on AP tests) and the school-wide student achievement of a high school as defined by the state's standardized test.

For this study, AP student participation and AP student performance in 347 public high schools (grades 9-12) in the state of Florida were considered for the 2007-2008 school year. The state standardized test used for this study was the Florida Comprehensive Assessment Test (FCAT) which was the linchpin of the Florida DOE school grading system at the time of the study. The school-wide student achievement

used in this study was the Florida Department of Education (DOE) school grade points as defined by the 2008 FCAT.

The purpose of this study was to determine if there was a statistically significant relationship between the percentage of students in a high school who participated in the Advanced Placement (AP) program and the school-wide student achievement in the high school as defined by the 2008 school grading system by the Florida Department of Education. For those students who chose to participate in the AP Program within a school, this study determined if there was a statistically significant relationship between Advanced Placement (AP) student performance in a high school and the school-wide student achievement in the high school as defined by the 2008 school grading system from the Florida Department of Education.

For this study, AP performance was determined by the percentage of students who completed at least one AP course and one AP exam in the same subject area and scored a 3, 4 or 5 on the AP exam. The focus of this study was all of the public high schools (grades 9-12) in the state of Florida in the 2007-2008 school year with the exception of charter schools, combination schools, schools that lacked students from each of the grades 9, 10, 11, and 12 or schools that had inconsistent data, i.e., data derived from the FDOE that did not match data supplied by school or data from College Board.

Research Questions

This study was guided by the following research questions:

1. What relationship existed, if any, between the percentage of students within a high school who participated in the Advanced Placement (AP) program (defined by completion of at least one course and completion of AP test in the same subject area) and the school-wide student achievement of a high school (defined by the 2008 Florida school grading system points)?
2. What relationship existed, if any, between the percentage of students who successfully performed in the Advanced Placement (AP) program (defined as completion of at least one AP course and AP exam in the same subject area and a score of 3, 4 or 5 on the AP exam) and the school-wide student achievement of a high school (defined by the 2008 Florida school grading system points)?

Data and Demographics

Data were collected from two sources: the Florida Department of Education (FDOE) (www.fldoe.org) and the College Board (www.collegboard.com). In June 2009, school grade points data were collected on the 347 public high schools (grades 9-12) from the 2007-2008 school year involved in this study from the Florida Department of Education website (Appendix A). In June 2009, information on each of the 347 high schools from the 2007-2008 school year involved in this study were collected on the

following variables: school name, minority rate, free and reduced lunch rate, 2008 school grade points, 2008 AP student performance and 2008 AP student participation from the Florida Department of Education website and the College Board website (Appendix B). It should be noted that there were 367 public high schools (grades 9-12) in the state of Florida in the 2007-2008 school year that were not combination schools or charter schools. Further investigation of these schools revealed that there were 20 high schools that had been inappropriately designated as high schools by the Florida DOE or these schools had inconsistent data. One of these schools was a school for 9th graders only and another was a technical school serving only 11th and 12th grade students. These two schools were removed from the data set because they did not serve grades 9-12 even though they were listed as such by the Florida Department of Education. The other 18 schools had inconsistent data, i.e., data derived from the FDOE did not match College Board data. Once these 20 schools were removed from the study, the final number of schools involved in the study was 347 public high schools (grades 9-12) from the 2007-2008 school year.

In the data collection process, the researcher noted that in the new high school grading system established by the FDOE, the state valued each AP test uniquely even if the same student takes multiple tests. Therefore, the same student could count multiple times in the method used by the state to determine a school's AP participation rate and AP performance rate. For the sake of this study, however, as noted, a student was only counted once in determining AP participation and AP performance rates. The data, once

collected, were organized into a table and entered into an SPSS worksheet. The data were analyzed using several statistical procedures to answer the two research questions.

For each of the 347 public high schools in the state of Florida in the 2007-2008 school year, the following 2008 demographic data were collected and displayed using an SPSS worksheet: (a) school name noted by a corresponding number; (b) minority rate in the school as defined by the percentage of students who were non-white, (c) free and reduced lunch rate as defined by the percentage of students who qualified for federal assistance in the form of free or reduced lunch based on household income from the previous year, (d) 2008 school grade points as defined by the Florida Department of Education (DOE) school grade system, (e) 2008 AP performance rate as defined by the percentage of students who successfully performed in the Advanced Placement (AP) program (completion of one AP course and AP exam in the same subject area and a score of 3, 4 or 5 on the exam), and (f) 2008 AP participation rate as defined by the percentage of students within a high school who participated in the Advanced Placement (AP) program (completion of at least one AP course and completion of AP test in the same subject area).

In the area of minority rate, there was a relatively equal distribution of high, low and medium minority rates in schools in the state of Florida in the 2007-2008 school year. Because minority has been defined as non-white, this category included the following ethnicities: African-American, Hispanic, Indian American, Asian, Mixed or Other. One school in south Florida was reported by the FDOE as having a 100% minority

rate, Miami Northwestern, while five schools were below 10% in minority rate. In Table 3, the 347 public high schools (grades 9-12) are organized according to minority rate.

Table 3
Minority Rate in Florida High Schools (Grades 9-12) in 2007-2008 Year (N=347)

Number of Schools (%)	Minority Rate of Students Within the School
73 schools (21%)	75% - 100%
73 schools (21%)	50% - 74%
132 schools (38%)	25% - 49%
69 schools (20%)	0% - 24%

Source: Florida Department of Education. "School grade information: 2008."
Note: Minority rate is defined as non-white.

When free and reduced lunch rate was considered, there was not one high school in the state that lacked students on free and reduced lunch, and there were no high schools that had all of their students on free and reduced lunch. Glades Central High School in Palm Beach County had the highest free and reduced lunch rate (89%) in the 2007-2008 school year in the state of Florida. Bartram Trails High School in St. Johns County had the lowest free and reduced rate in the state at 3%. Only 9 schools (2%) in the state of Florida of 369 high schools had a free and reduced rate of 75% or higher, and all of these schools had a minority rate that was 95% or higher. In Table 4, the 347 high schools in the state of Florida are organized according to free and reduced lunch rate.

Table 4
Free and Reduced Rate in Florida High Schools (Grades 9-12) in 2007-2008 Year (N=347)

Number of Schools (%)	Free and Reduced Lunch Rate of Students Within the School
82 schools (24%)	0% - 24%
170 schools (49%)	25% - 49%
87 schools (25%)	50% -74%
8 schools (2%)	75% - 100%

Source: Florida Department of Education. "School grade information: 2008."

For the area of school grade points, the highest point total in the state was Design and Architectural School in Miami-Dade County with 686 points out of a potential 800 points on the Florida DOE school grade system in the 2007-2008 school year. From a school grade points standpoint, the lowest performing school in the state was also out of Dade County: Carol City High School with 360 points out of a potential 800 points. Of the 15 "F" schools in the state of Florida in the 2007-2008 school year, 6 of the schools were from Dade County: Carol City, Miami Norland, Corporate Academy South, Miami Central, Homestead and North Miami.

Of the highest ranked "A" schools in the state of Florida in the 2007-2008 school year based on the school grade points system from the FDOE, the top four schools were magnet schools for their entire districts: Maritime and Science Technology (Dade), Design and Architectural (Dade), Paxon (Duval) and Dreyfoos School of the Arts (Palm Beach). Of the top 25 ranked schools in the state by school grade points, the average free and reduced lunch rate was 14% with a low of 3% (Bartram Trail). Of the bottom 25 ranked schools in the state by school grade points, the average free and reduced rate was

65% with a high of 89% (Glades Central). Table 5 displays the 347 high schools according to letter grade and school grade points.

Table 5
School Grade Points and School Grades for Florida High Schools (Grades 9-12) (N=347)

Number of Schools (%)	Letter Grade (A-F) and School Grade Points Range (0-800)
10 "F" schools (3%)	F-rated schools with range on points from 360-394
66 "D" schools (19%)	D-rated schools with range on points from 395-494
94 "C" schools (27%)	C-rated schools with range on points from 435-518
77 "B" schools (22%)	B-rated schools with range on points from 495-597
100 "A" schools (29%)	A-rated schools with range on points from 525-735

Source: Florida Department of Education. "School grade information: 2008."

In regard to Advanced Placement (AP) student participation in the state of Florida in the 2007-2008 school year, 55 schools in the state of Florida had AP participation rates of 10% or less. Only 10 high schools had an AP student participation rate of 50% or higher which means at least one of every two students in the school including each grade level, 9-12, took at least one AP course and the accompanying AP exam. All of these schools were "A" rated by the state on the school grade system: Titusville (Brevard), Eau Gallie (Brevard), P.K. Yonge (Gainesville), Crawford Mosley (Bay), Pace (Santa Rosa), Sail (Leon), Spruce Creek (Volusia), Melbourne (Brevard), Palm Harbor (Pinellas) and Gulf Breeze (Santa Rosa).

For analysis of demographics, the following data were developed: (a) the 347 Florida public high schools listed by corresponding number with school grade

information; (b) the 347 Florida public high schools listed by minority rate from lowest to highest with other data included; (c) the 347 Florida public high schools listed by free and reduced lunch rate from lowest to highest with other data included; (d) the 347 Florida public high schools listed by the lowest 25% in the area of free and reduced lunch, middle 50% in the area of free and reduced lunch and the highest 25% in the area of free and reduced lunch with other data included; (e) the 347 Florida public high schools listed by school grade points from lowest to highest with other data included; (f) the 344 Florida public high schools listed by AP student performance from lowest to highest with other data included (3 schools lacked data regarding the AP program); and (g) the 344 Florida public high schools listed by AP student participation from lowest to highest with other data included. Demographic data related to school grades and variables are included in Appendix A.

Analysis of Data

This section was arranged according to the two research questions that guided this study. The research questions were stated and followed by a discussion of data.

Research Question 1

What relationship existed, if any, between the percentage of students within a high school who participated in the Advanced Placement (AP) program (defined by completion of at least one course and completion of AP test in the same subject area) and the school-wide student achievement of a high school (defined by the 2008 Florida school grading system points)?

In order to identify any relationship that existed between the percentage of students within a high school who participated in the AP program and the school-wide student achievement of a high school, data were collected for all of the public high schools (grades 9-12) in the state of Florida in the 2007-2008 school year. These data were collected from the Florida Department of Education (www.fldoe.org) and the College Board (www.collegeboard.com) and placed into an SPSS worksheet. The population of this study (N = 347) was defined to be all high schools in the state of Florida in 2008 with the exception of charter high schools, combination schools, schools that lacked each grade level of 9th through 12th and schools with inconsistent data. Each of these 347 public high schools (grades 9-12) earned a school grade from the Florida Department of Education in the 2007-2008 school year. These schools were the focus of this study.

Research Question 1 was investigated through several analyses. First, a Pearson product moment analysis was used to test the correlation between the percentage of students within a high school who participated in the AP program and the school-wide student achievement of the high school as defined by the FDOE school grading system. There was a positive correlation between AP student participation and school grade points, $r = .586$, $n = 344$, $p < .01$. These results are summarized in Table 6. As noted, there were 3 high schools in the state that lacked AP student participation and AP student performance data bringing the original total of 347 schools to 344 schools in those areas.

Table 6
Correlations Between AP Student Participation and School Grade Points (N=344)

Variables	Analysis	AP Participation	School Grade Points
AP Participation	Pearson Correlation	1	.586(**)
School Grade points	Pearson Correlation	.586(**)	1

Note. AP = Advanced Placement; Points = school grade points.
**Correlation is significant at the 0.01 level (2-tailed).

In addition, the researcher calculated a bivariate linear regression model with school grade points as the dependent variable and AP participation as the independent variable. The results are shown in Table 7. The researcher sought to determine if the variable of AP participation could help predict school grade points. A regression analysis was used to determine if a model to predict school grade points could be created. The dependent variable was school grade points as defined by the 2008 FDOE school grading system. The independent variable was AP participation. The regression equation determined by the analysis was school grade points = 439 + 3.27 (AP Participation). The R value was .586 and the R squared value was .343.

Table 7
Prediction Equation Based on Linear Regression (N=344)

Model	Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	439.360	5.546		79.22	.000
	AP Participation	3.2655	0.2442	.586	13.37	.000

Note. (a) Dependent variable = school grade points. AP = Advanced Placement

Furthermore, the relationships between school grade points and AP student participation can be viewed graphically. The researcher established a scatter plot (Figure 1) which was useful in determining whether a linear relationship was present. The scatter plot, which displays school grade points as the Y axis and AP student participation as the X axis, permitted the statistical assumptions to be visually examined. Based on the scatter plot, school grade points and AP student participation visually indicate a linear relationship.

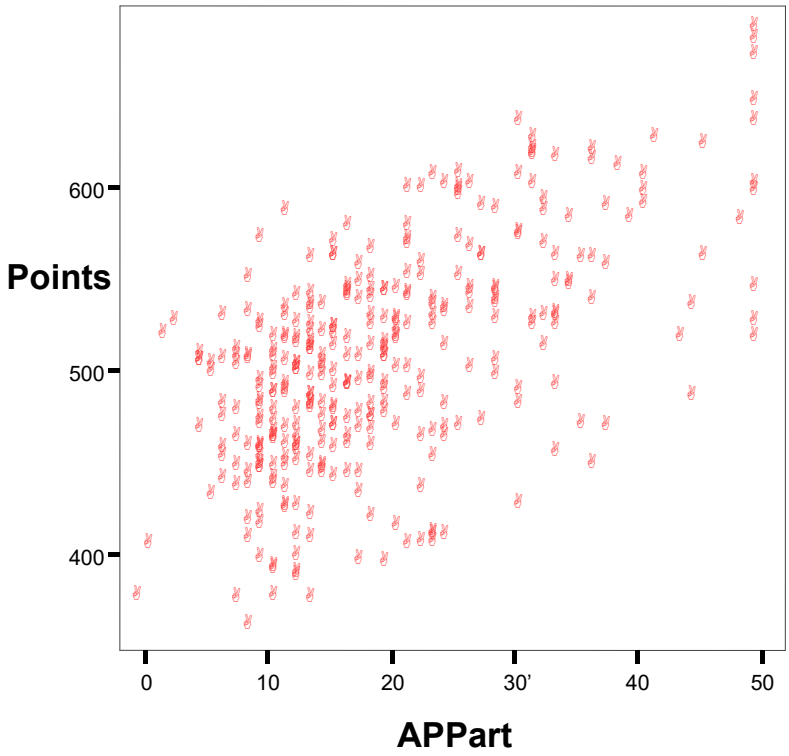

Figure 1. School Grade Points (Points) and Student Participation (APPart)(N=344).

Research Question 2

What relationship existed, if any, between the percentage of students who successfully performed in the Advanced Placement (AP) program (defined as completion of at least one AP course and AP exam in the same subject area and a score of 3, 4 or 5 on the AP exam) and the school-wide student achievement of a high school (defined by the 2008 Florida school grading system points)?

In order to identify any relationship that existed between the percentage of students who successfully performed in the Advanced Placement (AP) program (defined as completion of at least one AP course and AP exam in the same subject area and a score of 3, 4 or 5 on the AP exam) and the school-wide student achievement of a high school (defined by the 2008 Florida school grading system points), data were collected for all of the public high schools (grades 9-12) in the state of Florida in the 2007-2008 school year. Data were collected from the Florida Department of Education (www.fldoe.org) and the College Board (www.collegeboard.com) and placed into an SPSS worksheet. The population of this study was defined to be all high schools in the state of Florida in 2008 with the exception of charter high schools, combination schools, schools that lacked each grade level 9-12, and schools with inconsistent data. Each of these 347 public high schools (grades 9-12) earned a school grade from the Florida Department of Education in the 2007-2008 school year. These schools were the focus of this study.

Question 2 was investigated through two analyses. A Pearson product moment analysis was used to test the correlation between the percentage of students within a high school who successfully performed in the AP program and the school-wide student achievement of the high school as defined by the Florida DOE school grading system.

These results are summarized in Table 8. There was a positive correlation between AP student performance and school grade points, $r = .454$, $n = 344$, $p < .01$. There were three high schools in the state that lacked AP student participation and AP student performance data bringing the original total of 347 schools to 344 schools in those areas.

Table 8
Inter-correlations Among AP Student Participation, AP Student Performance, and School Grade Points (N=344)

Variables	Analysis	AP Participation	AP Performance	School Grade Points
AP Participation	Pearson Correlation	1	-	.586(**)
AP Performance	Pearson Correlation	-	1	.454(**)
School Grade Points	Pearson Correlation	.586(**)	.454(**)	1

Note. AP = Advanced Placement.
**Correlation is significant at the 0.01 level (2-tailed).

In addition, the researcher calculated a bivariate linear regression model with school grade points as the dependent variable and AP performance as the independent variable. The results are shown in Table 9. The researcher sought to determine if the variable of AP performance could help predict school grade points. Through a regression analysis, it could be determined if a model to predict school grade points could be created. The dependent variable was school grade points as defined by the 2008 FDOE school grading system. The independent variable was AP performance. The regression equation determined by the analysis was school grade points = 432 + 2.18 (AP Performance). The R value was .454 and the R squared value was .206.

Table 9
Prediction Equation: School Grade Points and AP Student Performance

		Unstandardized Coefficients		Standardized Coefficients		
Model	Variable	B	Std. Error	Beta	t	Sig
1	(Constant)	432.282	8.235		52.491	.000
	AP Performance	2.176	0.231	.454	9.411	.000

Note. Dependent variable is school grade points. AP = Advanced Placement Performance.

Ancillary Analyses

The state of Florida experienced significant diversity and variance in terms of minority rate and free and reduced lunch rate in the public high schools (grades 9-12) in the 2007-2008 school year. More than 8 of 10 schools (81%) had a minority rate of 25% or higher, and almost half (42%) of the schools had minority rates of 50% or higher. Over 75% of the high schools had a free and reduced lunch rate of 25% or higher, and there was not one of the 347 high schools in the state that had no students who qualified for free and reduced lunch status. Based on the level of diversity in Florida's high schools, in terms of minority rate and free and reduced lunch rate, the researcher wanted to determine if there was a relationship between minority rate and school grade points or a relationship between free and reduced lunch rate and school grade points. Did these two variables (minority rate and free and reduced lunch rate) have a more significant relationship with school-wide student achievement than the variables (AP participation rate and AP performance rate) that were the basis of this study?

A Pearson product moment analysis was used to test the correlation between the minority rate within a high school and the school-wide student achievement of the high school as defined by the Florida DOE school grading system in the 2007-2008 school year. There was a negative correlation between minority rate and school grade points, $r = -.529$, $n = 347$, $p < .01$. This relationship was significant at an 0.01 level (two-tailed). The negative relationship essentially means that the higher the minority rate the lower the school-grade points. These results are summarized in Table 10.

Table 10
Inter-correlations Among Free and Reduced Rate, Minority Rate and School Grade Points (N=347)

Variables	Analysis	Free/Reduced	Minority	Points
Free/Reduced Lunch	Pearson Correlation	1	.709(**)	-.779(**)
Minority Rate	Pearson Correlation	.709(**)	1	-.529(**)
School Grade Points	Pearson Correlation	-.779(**)	-.529(**)	1

**Correlation is significant at the 0.01 level (2-tailed).

A Pearson product moment analysis was also used to test the correlation between the free and reduced lunch rate within a high school and the school-wide student achievement of the high school as defined by the Florida DOE school grading system in the 2007-2008 school year. There was also a strong, negative correlation between free and reduced lunch rate and school grade points, $r = -.779$, $n = 347$, $p < .01$. This relationship was also significant at a 0.01 level (two-tailed). The negative relationship essentially means that the higher the free and reduced lunch rate the lower the school-

grade points. These results are summarized in Table 10. There was also a positive correlation between free and reduced lunch rate and minority rate, $r = .709$, $n = 347$, $p < .01$. Of the four variables (AP participation, AP performance, minority rate and free and reduced lunch rate), the free and reduced lunch rate had the strongest relationship with school grade points. This result indicated that poverty had a more significant impact on school-wide student achievement than did the percentage of minority students in the school or the number of Advanced Placement courses offered. In this study, poverty, as reflected by free and reduced lunch rate status ($r = -.779$), had a much stronger relationship with school-wide student achievement as defined by the FDOE school grading system than did the other three variables: AP performance ($r = .454$), Minority rate ($r = -.529$) and AP participation ($r = .586$). Although free and reduced lunch status and minority rate are closely associated, in this case there was a significant difference between the correlation for free and reduced lunch ($r = -.779$) and school grade points and the correlation for minority rate ($r = -.529$) and school grade points.

The researcher sought to determine if the four variables of AP participation, AP performance, free and reduced lunch rate, and minority rate combined could help predict school grade points. Regression analysis was used to determine if a model to predict school grade points could be created. The dependent variable was school grade points as defined by the 2008 FDOE school grading system. The independent variables were AP participation, AP performance, free and reduced lunch rate, and minority rate.

Multiple regression analysis was used to investigate the extent to which school-wide factors of free and reduced lunch rate, minority rate, AP student participation and

AP student performance affected school-wide student achievement as defined by the FDOE school grading system. In this analysis, school grade points were analyzed as the dependent variable. The school-wide factors of AP performance, AP participation, free and reduced lunch and minority rate as the independent variables.

The sole significant component factor with the greatest unique contribution to the variance was the free and reduced lunch rate, standardized beta = -.578, $p < .01$. The other school-wide variables had a lesser impact than did free and reduced lunch rate: AP student performance (standardized beta = .227, $p < .01$), AP student participation (standardized beta = .295, $p < .01$) and minority rate (standardized beta = .031, $p < .01$). These results are summarized in Table 11. A multiple regression analysis was calculated to predict school grade points based on the free and reduced lunch rate, minority rate, AP participation rate and AP performance rate. The coefficient of determination indicated that a total of 70.7% ($R^2 = .707$) of the school grade points was accounted for by free and reduced lunch rate, minority rate, AP participation rate and AP performance rate.

When placed together as independent variables, free and reduced lunch rate, minority rate, AP student participation and AP student performance had a significant predictive quality for school grade points, R = .841. These data are summarized in Table 12. However, by eliminating any of the independent variables, the predictive ability was diminished. For example, by eliminating free and reduced lunch rate as an independent variable and using only AP performance, AP participation and minority rate, the relationship level decreased, R = .769. These data are summarized in Table 13.

Table 11
Prediction Equation: Four Variables Combined

Model	Variable	Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig
1	(Constant)	506.741	10.198		49.689	.000
	Minority Rate	.069	.106	.031	.654	.514
	Free/Reduced Lunch	-1.932	.167	.578	11.554	.
	AP Performance	1.091	.164	.227	6.664	.000
	AP Participation	1.645	.198	.295	8.291	**

Note. AP = Advanced Placement
**Significance <.01.

Table 12
Predicting School Grades Through Four Variables

Model	R	Multiple R^2	Adjusted R^2	Std. Error	Significance
1	.841(a)	.707	.704	32.155	<.00001

(a). Predictors: (Constant), AP Participation, AP Performance, Free and Reduced Lunch Rate and Minority Rate.

Table 13
Predicting School Grades Through Three Variables

Model	R	Multiple R^2	Adjusted R^2	Std.Error	Significance
1	.769(a)	.591	.588	37.921	<.00001

(a). Predictors: (Constant), AP Participation, AP Performance and Minority Rate.

Because the area of free and reduced lunch was such a significant factor in school grade points, the researcher wanted to determine if various segments of schools in the

area of poverty would have a stronger relationship with AP student participation. The data on schools were organized according to free and reduced lunch rate and divided into three segments: the lower 25% in the area of free and reduced lunch rate, the middle 50% in the area of free and reduced rate, and the highest 25% in the area of free and reduced lunch rate. The researcher was trying to determine if there was a more significant correlation in relation to the area of AP participation dependent on the level of poverty found within a high school. Determination of the significance of segments of the free and reduced lunch population would potentially allow the researcher to accurately predict AP student participation rates. Of the 347 high schools included in this study, the lower 25% of schools (the most affluent) was comprised of 86 schools, the middle 50% was comprised of 175 schools and the upper 25% of schools (the poorest) included 86 schools. After schools lacking appropriate data were removed from the data set, the middle 50% was 173 schools, the upper 25% was 85 schools and the lower 25% remained at 86 schools.

A Pearson product moment analysis was used to test the correlation between the percentage of students within a high school who participated in the AP program and the percentage of students within a high school who qualified for free and reduced lunch status in the three segments of the population of schools. These results are summarized in Table 14.

There was a negative correlation between AP student participation and the lower 25% of schools in the area of free and reduced lunch, $r = -.301$, $n = 86$, $p < .01$. In other words, the lowest 25% of high schools in the state of Florida in the 2007-2008 school

year in the area of free and reduced lunch (i.e., the most affluent schools in the state) were impacted in a significant way by the number of students who participate in the AP program. However, schools in the upper 75% in the area of free and reduced lunch (middle 50% and upper 25% combined) lacked a significant relationship with AP participation. There was no significant correlation found between AP student participation and the middle 50% of schools in the area of free and reduced lunch, $r = -.138$, $n = 173$, $p < .01$, and there was no significant correlation found between AP student participation and the least affluent schools in the state, the upper 25% in the area of free and reduced lunch, $r = -.020$, $n = 85$, $p < .01$.

Table 14
Pearson Correlation Between Segments of Free and Reduced Lunch Population and AP Participation (N=344)

Percentage	Analysis	Number of Schools	Sig. (2-tailed)	AP Participation
Lower 25%	Pearson Correlation	86	.005	-.301(**)
Middle 50%	Pearson Correlation	173	.071	-.138
Upper 25%	Pearson Correlation	85	.856	-.020

Note. AP = Advanced Placement
**Correlation is significant at the 0.01 level (2-tailed).

The final analysis was a comparison of the relationship between AP student participation and school grade points within the two opposite segments of the population, the most affluent schools (the lowest 25% in the area of free and reduced lunch) and the poorest schools (the highest 25% in the area of free and reduced lunch).

Two analyses were used for each segment of the population. First, for the most affluent schools, a Pearson product moment analysis was used to test the correlation between the percentage of students within a high school who participated in the AP program and the school-wide student achievement of the high school as defined by the FDOE school grading system. There was a positive correlation between AP student participation and school grade points in the affluent schools, $r = .584$, $n = 86$, $p < .01$. These results are summarized in Table 15. The correlation between AP student participation and school grade points for the most affluent schools as defined by free and reduced lunch ($r = .584$) is very similar to the correlation between AP student participation and school grade points for all 344 schools in the state ($r = .586$).

In addition, the researcher calculated a bivariate linear regression model with school grade points as the dependent variable and AP participation as the independent variable or the 86 most affluent schools in the state of Florida in the 2007-2008 school year. The results are shown in Table 16.

Table 15
Correlation Between AP Student Participation and School Grade Points in Affluent Schools (N=86)

Variables	Analysis	AP Participation	School Grade Points
AP Participation	Pearson Correlation	1	.584(**)
School Grade points	Pearson Correlation	.584(**)	1

Note. AP = Advanced Placement; Points = school grade points.
**Correlation is significant at the 0.01 level (2-tailed).

Table 16
Prediction Equation Based on Linear Regression: Affluent Schools (N=86)

		Unstandardized Coefficients		Standardized Coefficients		
Model	Variable	B	Std. Error	Beta	t	Sig
1	(Constant)	505.00	11.04		45.76	.000
	AP Participation	2.316	0.3522	.584	6.59	.000

Note. (a) Dependent variable = school grade points.

The researcher sought to determine if the variable of AP participation could help predict school grade points. A regression analysis was used to determine if a model to predict school grade points could be created. The dependent variable was school grade points as defined by the 2008 FDOE school grading system. The independent variable was AP participation. The regression equation determined by the analysis was school grade points = 505 + 2.32 (AP Participation). The R value was .341. This is not an ideal predictor model, but AP participation does account for approximately a third of variance in a school's grade. The coefficient of reg (2.32) is significant beyond the .000 level. The majority of the outliers reside in conjunction with higher participation schools.

Two analyses were used as well for the poorest schools (the highest 25% in the state of Florida as defined by free and reduced lunch status). First, a Pearson product moment analysis was used to test the correlation between the percentage of students within a high school who participated in the AP program and the school-wide student achievement of the high school as defined by the FDOE school grading system. For the poorest schools in the state, AP participation is not strongly correlated with school grade points, $r = .259$, $n = 85$, $p < .01$, though it is statistically significant ($p = .017$) given the

sample size. These results are summarized in Table 17. The correlation between AP student participation and school grade points for the poorest schools as defined by free and reduced lunch (r = .259) is much less significant to the correlation between AP student participation and school grade points for all 344 schools in the state (r = .586) or the correlation between AP student participation and school grade points for the most affluent schools in the state (r = .584).

Table 17
Correlation Between AP Student Participation and School Grade Points in Poorest Schools (N=85)

Variables	Analysis	AP Participation	School Grade Points
AP Participation	Pearson Correlation	1	.259(**)
School Grade points	Pearson Correlation	.259(**)	1

Note. AP = Advanced Placement; Points = school grade points.
**Correlation is significant at the 0.01 level (2-tailed).

In addition, the researcher calculated a bivariate linear regression model with school grade points as the dependent variable and AP participation as the independent variable or the 85 poorest schools in the state of Florida in the 2007-2008 school year. The results are shown in Table 18. The researcher sought to determine if the variable of AP participation could help predict school grade points. A regression analysis was used to determine if a model to predict school grade points could be created. The dependent variable was school grade points as defined by the 2008 FDOE school grading system. The independent variable was AP participation. The regression equation determined by the analysis was school grade points = 430 + 1.43 (AP Participation). The R value was

.067 and the R squared value was .056. There is a statistically significant linear relationship between AP student participation and school grade points as indicated by the regression analysis. The coefficient of regression (1.425) is statistically significant as indicated in ANOVA (F = 5.95, p = .017). However, this is a function of the sample size. Only approximately 6% of the variance is explained. In other words, the mean school grade point (451.48) is almost as predictive of school grade points as the linear model.

Table 18
Prediction Equation Based on Linear Regression: Poorest Schools (N=85)

		Unstandardized Coefficients		Standardized Coefficients		
Model	Variable	B	Std. Error	Beta	t	Sig.
1	(Constant)	429.708	9.929		43.28	.000
	AP Participation	1.4253	0.5842	.259	2.44	.017

Note. (a) Dependent variable = school grade points.

Summary

Chapter 4 described the results of the analysis of the school data on minority rate, free and reduced lunch rate, AP student participation, AP student performance and school grade points. The key findings included the following:

1. In the 2007-2008 school year in the state of Florida, the Advanced Placement (AP) program was a major part of the educational landscape in public high schools (grades 9-12). Not one school of 343 high schools in the state of Florida failed to offer any AP courses to its students. Ten public high schools in the state had a 50% or higher AP participation rate, signaling that at least

one of every two students in the school participated in at least one AP course during the school year. Only 55 of 344 schools in the state had an AP student participation rate of 10% or below. Therefore, the vast majority of schools in the state of Florida had expanded the AP program in their schools to the point of having between 15% and 25% of their students participating in AP courses each year. The federal, state and local initiatives to expand AP from the College Board, politicians, school boards, superintendents and other sources had been successful.

2. The 347 public high schools (grades 9-12) in the state of Florida in the 2007-2008 school year were diverse in terms of minority rate and free and reduced lunch rate. The average minority rate (defined as non-white) was 49.27% and the average free and reduced lunch rate was 38.53%. Over 75% of the high schools had a free and reduced rate of 25% or higher, and almost half of the high schools in the state had a minority rate of 50% or higher.
3. There was a statistically significant relationship between the percentage of students within a high school who participated in the Advanced Placement (AP) program (as defined by completion of at least one AP course and completion of AP test in the same subject area) and the school-wide student achievement of a high school as defined by the 2008 Florida school grading system ($r = .586$, $n = 343$, $p < 0.01$). This relationship was confirmed graphically in a scatter plot in Figure 1. A regression analysis allowed the researcher to predict school grade points through AP student participation

with the following equation: school grade points = 439 + 3.27 (AP Participation). The R value was .586 and the R squared value was .343.

4. There was a statistically significant relationship between the percentage of students within a high school who successfully performed in the AP program (defined as completion of at least one AP course and AP exam in the same subject area and a score of 3, 4, or 5 on the AP exam) and the school-wide student achievement of a high school as defined by the 2008 Florida school grading system ($r = .454$, $n = 343$, $p < 0.01$). This relationship was confirmed graphically in a scatter plot in Figure 2. A regression analysis allowed the researcher to predict school grade points through AP student participation with the following equation: school grade points = 432 + 2.18 (AP Performance). The R value was .454 and the R squared value was .206.
5. There was a statistically significant relationship between the minority rate of students within a high school (as defined by students who were non-white) and the school-wide student achievement of a high school as defined by the 2008 Florida school grading system ($r = -.529$, $n = 347$, $p < 0.01$).
6. There was a statistically significant relationship between the percentage of students who received free and reduced lunch status and the school-wide student achievement of a high school as defined by the 2008 Florida school grading system ($r = -.779$, $n = 347$, $p < 0.01$).
7. The relationship between AP participation and AP performance and school-wide student achievement was positive, while the relationship between

minority rate and free and reduced lunch rate and school-wide student achievement was negative. Typically, a public school is somewhat in control of AP participation and AP performance, but a school cannot control how many students it serves that are minority students or students qualifying for free and reduced lunch status. Therefore, since there was a significant relationship between AP participation and AP performance and school-wide student achievement, a school should be encouraged to continue to invest in the AP program. However, the fact that only the most affluent schools, the lower 25% of schools in the state in the area of free and reduced lunch, showed a significant relationship between free and reduced lunch and AP participation leads one to believe that AP only has a significant impact in high-income schools. Further study in this area is needed so practitioners can understand the implication of students participating in the AP program regardless of socio-economic level.

8. In this study, poverty as reflected by free and reduced lunch rate status ($r = -.779$) had a much stronger relationship with school-wide student achievement as defined by the FDOE school grading system than did the other three variables: AP performance ($r = .454$), Minority rate ($r = -.529$) and AP participation ($r = .586$). This result reinforces much research that connects levels of poverty with school-wide student achievement on standardized tests. In this case, it was the Florida Comprehensive Assessment Test, otherwise known as FCAT, that served as the basis for the school grading system which

defined school-wide student achievement for this study. School leaders should keep in mind that poverty remains the most critical factor in school-wide student achievement regardless of how many AP courses are offered or what the level of achievement is on those AP courses.

9. The four school-wide variables (free and reduced lunch, minority rate, AP student participation and AP student performance), when placed together as independent variables in a regression analysis, predicted school grade points, to some extent, when school grade was the dependent variable, $R = .841$. Of course, past performance cannot always determine future performance as evidenced by the stock market. However, if the data on these four variables were available prior to school grades being released, it is possible that one could predict a high school's school grade from the Florida Department of Education.
10. Since free and reduced lunch rate was the most significant variable in predicting school grade points, the researcher wanted to determine if segments of the free and reduced population would have a significant relationship with the area of AP student participation. It was determined that the most affluent schools, the lowest quartile of schools in the area of free and reduced lunch, had a negative correlation with AP student participation, ($r = -.301$, $n = 86$, $p < 0.01$). However, the middle 50% ($r = .071$, $n = 173$, $p < 0.01$) and the upper 25% in the area of free and reduced lunch, ($r = -.020$, $n = 85$, $p < 0.01$) failed to show a correlation with AP student participation. This result makes

one question the impact of AP for schools of significant poverty or schools in the middle in terms of poverty. Does increasing AP student participation only increase school-wide student achievement in schools that are affluent?

11. Further analysis of this phenomenon took place through a comparison of the relationship between AP student participation and school grade points for two segments of the population, the most affluent schools (as defined by the lowest 25% of schools in the area of free and reduced lunch) and the poorest schools (as defined by the highest 25% of schools in the area of free and reduced lunch). It was determined that the most affluent schools ($r = .584$, $n = 85$) had a significant and very similar relationship between AP student participation and school grade points to all of the schools in the state ($r = .586$, $n = 344$). Yet, the poorest schools ($r = .259$, $n = 86$) had a much less significant relationship between AP student participation and school grade points as did the most affluent schools ($r = .584$) or all of the schools in the state ($r = .586$). Although it was suggested in the literature reviewed that increasing AP student participation would improve school-wide performance, this result did not support this premise. Analysis of the total data set of 347 public high schools in the state of Florida seemed to confirm this premise, but in the further analysis of segments of the schools, there did not seem to be an association between AP student participation and school-wide student achievement. For the poorest schools in the state, AP student participation did not seem to be a significant variable in school-wide student achievement.

What is the impact of AP in these schools, if any? Further research needs to be done to determine the answer so practitioners can understand the implications of AP participation in all schools, not just affluent or middle-class schools.

Chapter 5 will present a discussion of conclusions related to these findings and the practical implications of this study. Hypothesis tests will be reviewed and suggestions for future research will be discussed.

CHAPTER 5
SUMMARY OF FINDINGS, DISCUSSION, AND RECOMMENDATIONS

Introduction

In the 2007-2008 school year, the Advanced Placement (AP) program had taken a prominent place in the educational landscape of the American high school. More students than ever were taking AP courses and AP exams as a method of potentially earning college credit while in high school. Even with this tremendous growth, principals were pressured to expand the AP program further by the College Board, politicians, school boards, superintendents and others in an effort to increase school-wide student achievement. This premise that increasing AP student participation had a direct relationship with increasing school-wide student achievement was tested in this study.

Chapter 5 provides the results and conclusions of this study and contains a discussion of how the data presented in Chapter 4 relate to each of the research questions. The chapter concludes with the recommendations for future research and concluding comments.

Purpose of the Study

The intent of this study was to provide insight into the impact of the Advanced Placement (AP) program on school-wide student achievement. Two primary issues were considered: (a) the correlation between AP student participation in a high school and the school-wide student achievement of a high school as defined by the state's standardized

test and (b) the correlation between AP student performance and the school-wide student achievement of a high school as defined by the state's standardized test.

For this study, AP student participation and AP student performance in 347 public high schools (grades 9-12) in the state of Florida were considered for the 2007-2008 school year. The state standardized test used for this study was the Florida Comprehensive Assessment Test (FCAT) which was the linchpin of the Florida DOE school grading system at the time of the study. The school-wide student achievement used in this study was the Florida Department of Education (DOE) school grade points as defined by the 2008 FCAT.

The purpose of this study was to determine if there was a statistically significant relationship between the percentage of students in a high school who participated in the AP program and the school-wide student achievement in the high school as defined by the 2008 school grading system by the Florida Department of Education. For those students who chose to participate in the AP Program within a school, this study determined if there was a statistically significant relationship between AP student performance in a high school and the school-wide student achievement in the high school as defined by the 2008 school grading system from the Florida Department of Education. For this study, AP performance was determined by the percentage of students who completed at least one AP course and one AP exam in the same subject area and scored a 3, 4, or 5 on the AP exam. The focus of this study was all of the public high schools (grades 9-12) in the state of Florida in the 2007-2008 school year with the exception of charter schools, combination schools, schools that lacked students from each of the

grades 9, 10, 11, and 12 or schools that had inconsistent data, i.e., data derived from the FDOE that did not match data supplied by school or data from College Board.

Research Questions

This study was guided by the following research questions:

1. What relationship existed, if any, between the percentage of students within a high school who participated in the Advanced Placement (AP) program (defined by completion of at least one course and completion of AP test in the same subject area) and the school-wide student achievement of a high school (defined by the 2008 Florida school grading system points)?
2. What relationship existed, if any, between the percentage of students who successfully performed in the Advanced Placement (AP) program (defined as completion of at least one AP course and AP exam in the same subject area and a score of 3, 4 or 5 on the AP exam) and the school-wide student achievement of a high school (defined by the 2008 Florida school grading system points)?

Data and Demographics

Data were collected from two sources: the Florida Department of Education (FDOE) (www.fldoe.org) and the College Board (www.collegboard.com). In June 2009, school grade points data were collected on the 347 public high schools (grades 9-12) from the 2007-2008 school year involved in this study from the Florida Department of

Education website. In June 2009, information on each of the 347 high schools from the 2007-2008 school year involved in this study were collected on the following variables: school name, minority rate, free and reduced lunch rate, 2008 school grade points, 2008 AP student performance and 2008 AP student participation from the Florida Department of Education website and the College Board website. All grade points and variable data for the schools included in the study are displayed in Appendix A.

It should be noted that there were 367 public high schools (grades 9-12) in the state of Florida in the 2007-2008 school year that were not combination schools or charter schools. Further investigation of these schools revealed that there were 20 high schools that either had been inappropriately designated as high schools by the Florida DOE or had inconsistent data. One of these schools was a school for 9th graders only, and another was a technical school serving 11th and 12th grade students. These two schools were removed from the data set because they did not serve grades 9-12 students even though they were listed as such by the Florida Department of Education. The other 18 schools excluded from the study had inconsistent data, i.e., data derived from the FDOE that did not match College Board data. Once these 20 schools were removed from the study, the final number of schools involved in the study was 347 public high schools (grades 9-12) from the 2007-2008 school year. In the data collection process, the researcher noted that in the new high school grading system established by the FDOE, the state valued each AP test uniquely even if the same student takes multiple tests. Therefore, the same student could count multiple times in the method used by the state to determine a school's AP participation rate and AP performance rate. For the purposes of

this study, a student was counted only once in determining AP participation and AP performance rates. The data, once collected, were organized in tabular form and entered into an SPSS worksheet. The data were analyzed using several statistical procedures to answer the two research questions. For each of the 347 public high schools in the state of Florida in the 2007-2008 school year, the following 2008 demographic data were collected and displayed using an SPSS worksheet: (a) school name noted by a corresponding number; (b) minority rate in the school as defined by the percentage of students who were non-white, (c) free and reduced lunch rate as defined by the percentage of students who qualified for federal assistance in the form of free or reduced lunch based on household income from the previous year, (d) 2008 school grade points as defined by the Florida Department of Education (DOE) school grade system, (e) 2008 AP performance rate as defined by the percentage of students who successfully performed in the Advanced Placement (AP) program (completion of one AP course and AP exam in the same subject area and a score of 3, 4, or 5 on the exam), and (f) 2008 AP participation rate as defined by the percentage of students within a high school who participated in the Advanced Placement (AP) program (completion of at least one AP course and completion of AP test in the same subject area).

Summary and Discussion of the Findings

The following section contains a summary and discussion of the results of the data analysis. It has been organized to address the two primary research questions and the several ancillary questions that emerged within the study.

The purpose of this study was to determine if there was a statistically significant relationship between the percentage of students in a high school who participated in an Advanced Placement (AP) program and school-wide student achievement in the high school as defined by the 2008 school grading system by the Florida Department of Education. For those students who chose to participate in the AP Program within a school, this study determined if there was a statistically significant relationship between Advanced Placement (AP) student performance in a high school and the school-wide student achievement in the high school as defined by the 2008 school grading system from the Florida Department of Education. This correlational study involved two primary independent variables (AP student performance and AP student participation) and two secondary independent variables (free and reduced lunch rate and minority rate) and one (1) dependent variable (school grade points). Bivariate correlation, Pearson product moment correlation (r) and multiple regression were used in the treatment of the data.

Research Question 1

What relationship existed, if any, between the percentage of students within a high school who participated in the Advanced Placement (AP) program (defined by completion of at least one course and completion of AP test in the same subject area) and the school-wide student achievement of a high school (defined by the 2008 Florida school grading system points)?

In order to identify any relationship that existed between the percentage of students within a high school who participated in the AP program and the school-wide student achievement of a high school, data were collected for all of the public high schools (grades 9-12) in the state of Florida in the 2007-2008 school year. These data

were collected from the Florida Department of Education (www.fldoe.org) and the College Board (www.collegeboard.com) and placed into an SPSS worksheet.

Research Question 1 was investigated through two primary analyses. First, a Pearson product moment analysis was used to test the correlation between the percentage of students within a high school who participated in the AP program and the school-wide student achievement of the high school as defined by the FDOE school grading system. There was a positive correlation between AP student participation and school grade points, $r = .586$, $n = 344$, $p < .01$.

In addition, the researcher calculated a bivariate linear regression model with school grade points as the dependent variable and AP participation as the independent variable. The researcher sought to determine if the variable of AP participation could help predict school grade points. A regression analysis was used to determine if a model to predict school grade points could be created. The dependent variable was school grade points as defined by the 2008 FDOE school grading system. The independent variable was AP participation. The regression equation determined by the analysis was school grade points = 439 + 3.27 (AP Participation). The R value was .586 and the R squared value was .343. The results indicated that there was a significant relationship between AP student participation and school-wide student achievement as defined by school grade points ($r = .586$). Thus, there was evidence that AP student participation was related to school-wide student achievement.

Research Question 2

What relationship existed, if any, between the percentage of students who successfully performed in the Advanced Placement (AP) program (defined as completion of at least one AP course and AP exam in the same subject area and a score of 3, 4 or 5 on the AP exam) and the school-wide student achievement of a high school (defined by the 2008 Florida school grading system points)?

Research Question 2 was investigated through two primary analyses. A Pearson product moment analysis was used to test the correlation between the percentage of students within a high school who successfully performed in the AP program and the school-wide student achievement of the high school as defined by the Florida DOE school grading system. There was a positive correlation between AP student performance and school grade points, $r = .454$, $n = 344$, $p < .01$.

In addition, the researcher calculated a bivariate linear regression model with school grade points as the dependent variable and AP performance as the independent variable. The researcher sought to determine if the variable of AP performance could help predict school grade points. Through a regression analysis, it could be determined if a model to predict school grade points could be created. The dependent variable was school grade points as defined by the 2008 FDOE school grading system. The independent variable was AP performance. The regression equation determined by the analysis was school grade points = 432 + 2.18 (AP Performance). The R value was .454 and the R squared value was .206.

The results of the analysis indicated that there was a significant relationship between AP student performance and school-wide student achievement as defined by

school grade points (r = .454). Thus, there was evidence that AP student performance was related to school-wide student achievement.

Ancillary Research Questions

Ancillary Research Question 1

What relationship existed, if any, between the percentage of students within a high school who qualified for federal assistance in free and reduced lunch and the school-wide student achievement as defined by school grade points?

Ancillary Research Question 1 was formulated to identify any relationship that existed between the percentage of students who qualified for federal assistance in free and reduced lunch and the school-wide student achievement as defined by school grade points. Data were analyzed for all of the public high schools (grades 9-12) in the state of Florida in the 2007-2008 school year.

A Pearson product moment analysis was used to test the correlation between the percentage of students within a high school who qualified for the free and reduced lunch program and the school-wide student achievement of the high school as defined by the Florida DOE school grading system. There was a strong and significant correlation ($r = -.779$, $n = 347$, $p < .01$) between free and reduced lunch and school grade points. The results indicated that there was a significant relationship between free and reduced lunch and school-wide student achievement as defined by school grade points ($r = -.779$). Thus, there was evidence that free and reduced lunch was strongly related to school-wide student achievement.

Ancillary Research Question 2

What relationship existed, if any, between the minority rate within a high school (as defined by the percentage of students who were non-white) and the school-wide student achievement as defined by school grade points?

Ancillary Research Question 2 sought to identify any relationship that existed between the minority rate (as defined by the percentage of students who were non-white) and the school-wide student achievement as defined by school grade points, data were collected for all of the public high schools (grades 9-12) in the state of Florida in the 2007-2008 school year. A Pearson product moment analysis was used to test the correlation between the minority rate within a high school and the school-wide student achievement of the high school as defined by the Florida DOE school grading system. There was a significant correlation between minority rate and school grade points, $r = -.529$, $n = 347$, $p < .01$.

The results indicated that there was a significant relationship between minority rate and school-wide student achievement as defined by school grade points ($r = -.529$). Thus, there was evidence that minority rate was related to school-wide student achievement.

Ancillary Research Question 3

Can school grade points be predicted through a regression analysis using the variables of AP student participation, AP student performance, free and reduced lunch rate and minority rate?

Ancillary Research Question 3 was posed to identify if school grade points could be predicted through the variables of AP student participation, AP student performance,

free and reduced lunch rate and minority rate. Regression analysis was used to determine if a model to predict school grade points could be created. In this analysis, school grade points were analyzed as the dependent variable and the school-wide factors (AP performance, AP participation, free and reduced lunch and minority rate) as the independent variables. The results indicated that school grade points could be predicted through an analysis of the four variables (R = .841).Thus, there was evidence that AP performance, AP participation, free and reduced lunch, and minority rate were useful in predicting school grade points.

Ancillary Research Question 4

Within each sub-group (most affluent, middle income, and poorest), what is the relationship, if any, between AP student participation and free and reduced lunch rate?

To answer the remaining ancillary research questions, the 347 high schools within the state of Florida were divided into three sub-groups: (a) most affluent schools as defined by the lowest 25% of schools in the state of Florida in the area of free and reduced lunch, (b) middle income schools as defined by the middle 50% of schools in the state of Florida in the area of free and reduced lunch, and (c) the poorest schools as defined by the highest 25% of schools in the state of Florida in the area of free and reduced lunch. The researcher used free and reduced lunch to organize the sub-groups because it was the strongest variable in the relationship with school grade points.

A Pearson product moment analysis was used to test the correlation between AP participation within a high school and the free and reduced lunch rate of the high school

for each of the three sub-groups It was determined that the most affluent schools, the lowest quartile of schools in the area of free and reduced lunch, had a negative correlation with AP student participation, ($r = -.301$, $n = 86$, $p < 0.01$). However, the middle 50%, ($r = .071$, $n = 173$, $p < 0.01$) and the upper 25% in the area of free and reduced lunch, ($r = -.020$, $n = 85$, $p < 0.01$) failed to show a correlation with AP student participation. Therefore, in schools in the state of Florida of significant poverty and mid-level poverty, there was no relationship between free and reduced lunch and AP student participation. The results indicated that only the most affluent schools in the state (the highest quartile of schools in the area of free and reduced lunch) showed a relationship between AP participation and free and reduced lunch.

Thus, there was not consistent evidence that there was a relationship between free and reduced lunch and AP participation within each of the sub-groups: the most affluent schools, the middle-income schools, and the poorest schools. The most affluent schools, those in the lowest quartile in the area of free and reduced lunch, showed a significantly higher level of AP student participation.

Ancillary Research Question 5

In the most affluent public high schools (grades 9-12) in the state of Florida in the 2007-2008 school year (as defined by the lowest 25% of schools in the area of free and reduced lunch rate), what relationship existed, if any, between the percentage of students within a high school who participated in the Advanced Placement (AP) program (defined by completion of at least one course and completion of AP test in the same subject area) and the school-wide student achievement of a high school (defined by the 2008 Florida school grading system points)?

Ancillary Research Question 5 was investigated using a Pearson product moment analysis to test the correlation between the percentage of students within a high school who participated in the AP program and the school-wide student achievement, as defined by the FDOE school grading system, of the most affluent high schools in the state. There was a positive correlation between AP student participation and school grade points, $r = .584$, $n = 344$, $p < .01$

When all of the 347 schools in the state of Florida were considered, there was a positive relationship between AP student participation and school grade points ($r = .584$). The same was true for the most affluent schools (as defined by the lowest 25% of schools in the area of free and reduced lunch rate). There was a significant relationship between AP participation and school grade points in the most affluent schools in the state ($r = .584$). There was consistent evidence that a relationship existed between AP participation and school-wide student achievement as defined by school grade points in the most affluent schools in the state.

Ancillary Research Question 6

In the poorest public high schools (grades 9-12) in the state of Florida in the 2007-2008 school year (as defined by the lowest 25% of schools in the area of free and reduced lunch rate), what relationship existed, if any, between the percentage of students within a high school who participated in the Advanced Placement (AP) program (defined by completion of at least one course and completion of AP test in the same subject area) and the school-wide student achievement of a high school (defined by the 2008 Florida school grading system points)?

Ancillary Research Question 6 was investigated using a Pearson product moment analysis to test the correlation between the percentage of students within a high school who participated in the AP program and the school-wide student achievement of the high school within the poorest high schools in the state. There was a minimal correlation ($r = .259$) between AP student participation and school grade points in the poorest high schools in the state of Florida.

When all of the 347 schools in the state of Florida were considered, there was a positive relationship between AP student participation and school grade points ($r = .586$). The same was not true with the poorest schools in the state as defined by the highest 25% of schools in the area of free and reduced lunch rate. There was a much less significant relationship between AP participation and school grade points in the poorest schools in the state ($r = .259$). The evidence of a relationship between AP participation and school-wide student achievement as defined by school grade points in the poorest schools in the state was inconsistent.

Discussion of Findings

The AP program has grown tremendously over the past two decades. In the 2007-2008 school year, not one school in the state of Florida of 343 high schools failed to offer any AP courses to its students. Ten public high schools in the state had a 50% or higher AP participation rate, signaling that at least one of every two students in the school participated in at least one AP course during the school year. Only 55 of 344 schools in the state had an AP student participation rate at 10% or below. Therefore, the vast majority of schools in the state of Florida had expanded the AP program in their schools to the point of having between 15% and 25% of its students participating in AP courses each year. The federal, state and local initiatives to expand AP from the College Board, politicians, school boards, superintendents and other sources had been successful.

A significant relationship was identified between AP participation and school grade points. A regression analysis allowed the researcher to predict school grade points through AP student participation with the following equation: School grade points = 439 + 3.27 (AP Participation). The R value was .586 and the R squared value was .343.

There was a statistically significant relationship between the percentage of students within a high school who participated in the Advanced Placement (AP) program (as defined by completion of at least one AP course and completion of AP test in the same subject area) and the school-wide student achievement of a high school as defined by the 2008 Florida school grading system ($r = .586$, $n = 343$, $p < 0.01$). Thus, in Florida high schools, higher rates of participation by students in AP programs were accompanied by higher school-wide achievement.

A significant relationship was identified between AP performance and school grade points. A regression analysis allowed the researcher to predict school grade points through AP student participation with the following equation: school grade points = 432 + 2.18 (AP Performance). The R value was .454 and the R squared value was .206. There was a statistically significant relationship between the percentage of students within a high school who successfully performed in the AP program (defined as completion of at least one AP course and AP exam in the same subject area and a score of 3, 4, or 5 on the AP exam) and the school-wide student achievement of a high school as defined by the 2008 Florida school grading system ($r = .454$, $n = 343$, $p < 0.01$). This indicated that in Florida high schools where high percentages of students performed successfully in an AP program, achievement was also high.

A significant relationship was identified between free and reduced rate and school grade points and minority rate and school grade points. The schools in the state of Florida in the 2007-2008 school year were diverse in terms of free and reduced rate and minority rate. The average minority rate (defined as non-white) was 49.27% and the average free and reduced lunch rate was 38.53%. Over 75% of the high schools had a free and reduced rate at 25% or higher and almost half of the high schools in the state had a minority rate of 50% or higher. There was a statistically significant relationship between the minority rate of students within a high school (as defined by students who were non-white) and the school-wide student achievement of a high school as defined by the 2008 Florida school grading system ($r = -.529$, $n = 347$, $p < 0.01$).There was a statistically significant relationship between the percentage of students who received free and reduced

lunch status and the school-wide student achievement of a high school as defined by the 2008 Florida school grading system ($r = -.779$, $n = 347$, $p < 0.01$). Thus, schools with higher percentages of minority students and higher free and reduced rates had lower achievement than did schools with lower percentages of each.

School grade points were able to be predicted through the four variables of AP participation, AP performance, free and reduced lunch and minority rate. The four school-wide variables (free and reduced lunch, minority rate, AP student participation and AP student performance) when placed together as independent variables in a regression analysis served, to some extent, as predictors of school grade points when school grade was the dependent variable, $R = .841$. Of course, past performance cannot always determine future performance as evidenced by the stock market. However, if the data on these four variables were available prior to school grades being released, it is possible that one could predict a high school's school grade from the Florida Department of Education. The relationship between AP participation and AP performance and school-wide student achievement was positive, while the relationship between minority rate and free and reduced lunch rate and school-wide student achievement was negative. Typically, a public school is somewhat in control of AP participation and AP performance, but a school cannot control how many minority students it serves or how many students qualify for free and reduced lunch status. Since there was a significant positive relationship between AP participation and AP performance and school-wide student achievement, it would seem advisable for schools to continue to invest in the AP program. However, the fact that only the most affluent schools, the lower 25% of schools

in the state in the area of free and reduced lunch, showed a significant negative relationship between free and reduced lunch and AP participation leads one to believe that only the most affluent schools had a consistent process in place regarding AP participation. Further study in this area is needed so practitioners can understand the implication of students participating in the AP program regardless of socio-economic level.

Free and reduced lunch was the most significant factor in predicting school-wide student achievement (as defined by school grade points). In this study, poverty as reflected by free and reduced lunch rate status (r = -.779) had a much stronger relationship with school-wide student achievement as defined by the FDOE school grading system than did the other three variables: AP performance (r = .454), Minority rate (r = -.529) and AP participation (r = .586). This result reinforces much research that connects levels of poverty with school-wide student achievement on standardized tests. In this case, it was the Florida Comprehensive Assessment Test, otherwise known as FCAT, which was the basis for the school grading system defining school-wide student achievement for this study. School leaders should keep in mind that poverty remains the most critical factor in school-wide student achievement regardless of how many AP courses are offered or what the level of achievement is on those AP courses.

Only the most affluent schools showed a significant relationship between free and reduced lunch rate and AP participation. Since free and reduced lunch rate was the most significant variable in predicting school grade points, the researcher wanted to determine if segments of the free and reduced population would have a significant relationship with

the area of AP student participation. It was determined that the most affluent schools, the lowest quartile of schools in the area of free and reduced lunch, had a negative correlation with AP student participation, ($r = -.301$, $n = 86$, $p < 0.01$). However, the middle 50%, ($r = .071$, $n = 173$, $p < 0.01$), and the upper 25% in the area of free and reduced lunch, ($r = -.020$, $n = 85$, $p < 0.01$) failed to show a correlation with AP student participation. This result makes one question the level of AP participation for schools of significant poverty or schools in the middle in terms of poverty. Despite major increases in AP participation across the state, only in the most affluent schools did the rate of free and reduced lunch students participating in the AP program increase.

The poorest schools did not show a significant relationship between AP student participation and school grade points. In this study, the 347 schools were divided into the most affluent schools, middle schools, and the poorest schools. When all the 347 schools were considered, there was a significant relationship between AP student participation and school grade points ($n = .586$) and the same was true for the most affluent schools ($n = .584$). However, this was not the case for the poorest schools in the state. For these schools, there was a much less significant relationship between AP participation and school-wide student achievement as defined by school grade points ($r = .259$). For the poorest schools, AP participation did not lead to improved school-wide achievement.

Conclusions

This study culminates in several conclusions adding to the body of knowledge on AP student performance, AP student participation and school-wide student achievement

as defined by school grade points. Primarily, in this research, it was discovered that a significant relationship existed between AP student participation and school grade points and a significant relationship existed between AP student performance and school grade points. The results of this study can help school administrators and others to understand the implications of AP participation and AP performance on school-wide student achievement.

Research on the Advanced Placement program has primarily revolved around the AP student. Researchers have been interested in the success of the AP student in college compared to the non-AP student. Questions as to teacher quality issues and the support systems needed for the AP student to have success. Very little research has been conducted on the impact of the AP program on the non-AP student and for all students within a school. This study sought to understand the "rippling effect" of the AP program on the school and to measure, through standardized test scores, the impact of AP participation and AP performance on school-wide student achievement?

Clearly, AP participation and AP performance are significant factors in school-wide student achievement. However, there are many other variables such as teacher quality, student background, and leadership that are potentially significant factors in determining school-wide student achievement. As evidenced in this study, the level of poverty of students and the free and reduced lunch rate had a much stronger relationship with school-wide student achievement than did AP performance and AP participation. Furthermore, only the most affluent schools (the lowest quartile in the area of free and reduced lunch rate) showed a significant relationship between free and reduced lunch and

AP participation. This indicated that AP participation was not consistent across schools of various economic strata. Despite the incredible growth that has occurred in the AP program, schools in the lower 75% of the state in the area of free and reduced lunch still displayed much room for growth in the area of AP participation.

Furthermore, possibly the most interesting result from the study was that the poorest schools failed to show a significant relationship between AP student participation and school grade points. When all 347 schools were included in the data set, the relationship was significant between AP student participation and school grade points ($r = .586$, $n = 344$). And when the most affluent schools were included in the data set, there was a significant relationship between AP student participation and school grade points ($r = .584$, $n = 86$). However, when the poorest schools (as defined by the highest 25% of schools in the state in the area of free and reduced lunch rate) were analyzed, there was a much less significant relationship between AP student participation and school grade points ($r = .259$, $n = 85$). This is interesting and significant because the literature review and other data results from this study support that a positive relationship did exist between students participating in the AP program and school-wide student achievement as defined by a standardized test. Yet, when the poorest schools were analyzed as a group, the relationship between AP participation and school-wide student achievement as defined by school grade points was weak. This result leads one to believe that in the poorest schools in the state of Florida, AP participation has not had a significant impact on school-wide student achievement. If this is true, school leaders must question the viability of the AP program in their schools. A major question arises as to

whether the AP program in poor schools improves school-wide student achievement in the same way it does in middle class and affluent schools. If not, practitioners must consider what programs beyond the AP program will lead to improvement in school-wide student achievement.

Recommendations and Implications for Practice

The review of literature demonstrated that the Advanced Placement (AP) program continued to grow based on the present political school climate. Criticism of the AP program was reviewed along with the perspectives of school leaders on the impact of the AP program on school-wide student achievement. Minority participation in AP was discussed along with the future of the AP program and the school accountability program in the state of Florida.

Based on the review of the literature and the findings of this study, the following recommendations regarding implications for practice are made:

1. When considering the future growth of the AP program in each high school, school leaders must consider all the factors that will contribute to the success of the AP program: teacher quality, teacher training, student selection for the AP program, professional development and school culture. But most importantly, schools must consider their population. Based on the results of this study, AP participation and AP performance are significantly connected to school-wide student achievement. However, free and reduced lunch had the most significant relationship with school-wide student achievement. Schools

with more complex student populations, based on free and reduced lunch rate, face more significant obstacles in the success and viability of the AP program. Students from poverty have learning gaps and other obstacles to success in an AP course. These issues must be considered and addressed in order to provide the best environment for all students.

2. High schools face significant pressure to continue to grow in their AP course offerings, AP participation and AP performance. However, high school administrators and teachers must consider what programs give schools and individual students the greatest opportunities for success. For some schools, growth in the area of the AP program may not be the right solution. If a school continues to foster the growth of the AP program without providing fidelity and integrity within the AP courses, students could be left with a "watered-down" program. Growth in the AP program should be carefully considered to ensure that the right support systems are in place.
3. On a national, state and local scale, educational policymakers must consider the implications of the dramatic growth of the AP program. Present support systems and infrastructure should be analyzed and recommendations should be made regarding improved and innovative support systems for schools of all socioeconomic levels. For schools with significant free and reduced lunch populations, funding and infrastructure should be a priority in order to improve AP performance levels and college readiness.

4. An analysis of best practices within the AP program across schools of all socioeconomic levels (especially high poverty schools) should be investigated on a national, state, and local level by the College Board and other educational organizations. Mandatory training should occur in these "best practices" for each school striving to develop an AP program so that these research-based concepts are shared with all schools.
5. As schools change their AP enrollment policies from hand-selected, teacher-driven, elite policies to policies of open access where barriers are removed, all of the stakeholders (politicians, school leaders, school boards, superintendents, teachers, parents and students) must be patient in the effort to see immediate results. The rigor of the AP course, alone, is of benefit to the enrolled student. As the school builds capacity in the AP program, the AP performance results will most likely follow over time.
6. College admissions officers should consider how the AP program is weighted in terms of college admissions, college scholarships and financial aid packages and how college credit is awarded. On a national, state and local scale, college admissions and college credit through AP courses ought to be as consistent as possible. Through a national scale or consistent policy, high school students would stop receiving mixed messages from college admissions on how many AP courses ought to be taken and what results need to be secured in those courses in order to be useful to them as they matriculate into colleges. For example, University of Pennsylvania awards credit only in

courses where a student receives a score of a "5," but for most courses in all of the public universities in Florida accept college credit for a score of a "3."

7. Advanced Placement (AP) student access policies should be studied and considered on a national, state and local scale. Strategic placement of students into AP courses should strike a balance between the concepts of "access and equity" and the potential future AP performance of the individual student.

Recommendations for Future Research

Based on the findings of this study, recommendations for further research for school leaders and policymakers are presented:

1. This study included all of the public high schools (grades 9-12) in the state of Florida in the 2007-2008 school year other than charter schools, combination schools and schools with inconsistent data, but it provided for a one-year snapshot. There remains a need for a multi-year, longitudinal study to confirm the results and trends from this study in the state of Florida.
2. The results in regard to a significant relationship between AP participation and school-wide student achievement and AP performance and school-wide student achievement merit further study. A researcher should study data from states other than Florida to determine if the significant relationships identified in this study hold true across various states. Because the state standardized tests and method for determining school-wide student achievement have varied across states, a study would need to consider the implications of these differences.
3. Because of the variance between standardized tests across states, any researcher may wish to consider a nationally standardized test such as the Scholastic Aptitude Test (SAT) as a way to define school-wide student achievement. The potential issue with the SAT would be that not all students

in the school take the test, and access to the SAT varies dependent on school policies.

4. Further study of the sub-groups within Florida in the area of free and reduced lunch would allow the researcher to study and consider the implications of AP participation and AP performance in various areas of school-wide student achievement.
5. In a future study of similar nature, school size should be considered as a way to define the schools. In this study, high schools were simply defined as public schools serving grades 9-12 that were not combination schools, charter schools or schools with inconsistent data. High schools were included in this study that had as few as 200 students and as many as 4,500 students. Schools of such notable size difference vary in terms of needs and limitations and should be grouped accordingly in a future study.
6. A qualitative study of the high schools in the state of Florida based on surveys of principals, teachers and AP coordinators would allow the researcher to further understand how students access and participate in the AP program. AP participation cannot be fully understood from quantitative data, as schools vary dramatically in terms of how students access the AP program and how schools support AP performance.
7. States have not uniformly defined school-wide student achievement. For example, in the state of Florida, the high school accountability system has changed for the 2009-2010 school year to include graduation rate, college

readiness, acceleration performance, and acceleration participation. Previously, the state defined how a school's success solely on state standardized test results on the Florida Comprehensive Achievement Test, FCAT. In a future correlation study of various states in the area of school-wide student achievement, these changes and differences would have to be considered.

8. States also have varied considerably in the way that AP student participation and AP student performance have been defined. For the sake of this study, a student could only count once regardless of the number of AP courses that were completed or the number that were successfully performed in a school year. Some states have defined AP student participation based on the number of courses completed, counting multiple courses taken by the same student. Others have used an unduplicated head count system. The differences in the way the data are collected and reported to the state department of education should be considered when studying the areas of AP participation and performance.
9. Further research of poor schools (as defined by free and reduced lunch rate) in the state of Florida and other states is recommended in the area of AP student participation and its impact on school-wide student achievement. It needs to be determined if the results presented in this study are an anomaly or a legitimate result. Because of the present political climate, poorer schools are under intense pressure to expand their AP offerings. The question remains as

to whether such an increase is in the best interest of students, particularly those in poorer schools. Policymakers, educational leaders and others need to clearly understand the impact of AP participation. If AP does not have a significant impact on school-wide student achievement, practitioners must consider what programs might better serve students in the quest for improved school-wide student achievement. School leaders must make the difficult decisions on what programs to implement in their building. There may be programs such as dual enrollment, International Baccalaureate (IB), or career/technical programs that should be considered in addition or in place of the AP program to maximize the potential to positively impact school-wide student achievement.

10. Further research should include a quantitative study of access systems in individual high schools to investigate the relationship between the access system and the results on AP examinations.
11. Consider replicating this study using a forced entry multiple regression analysis in order to provide more in depth answers to the research questions.
12. Further research could include a qualitative study of successful high poverty schools with demonstrated high rates of AP participation and performance.
13. Replicate this study defining school-wide achievement as graduation rate or college attendance rate rather than school grade points.

14. Conduct a study of high poverty schools with a focus on teacher quality and teacher training to determine the relationship between these variables and student success

Summary

Even with the exceptional growth of the Advanced Placement (AP) program, high school educators have faced pressure to expand the AP program further. This pressure has come from national, state and local legislators, school boards, superintendents and other sources. Schools have been asked to increase the number of AP courses offered and to increase the number of students who take AP courses, especially the number of minority or low socioeconomic students who take AP courses. "We must encourage our kids to take more challenging courses, and the Advanced Placement program has been proven to make a difference in student performance," said former U.S. Education Secretary Margaret Spellings (2005, p. 41).

Morgan and Klaric's (2007) position that "One of the fundamental underpinnings of the AP Program is that students who perform well on AP examinations will be successful in college," (p. 1) has been debated in various studies. Dodd, Fitzpatrick, De Ayala, and Jennings (2002) had previously found that when AP students and non-AP students of similar abilities went to college, the AP students earned better grades. Adelman (1999) stated that the quality and rigor of the high school curriculum was the most important factor in college completion. Yet, Geiser and Santileces (2004) in their

University of California at Berkley study found that participation in Advanced Placement (AP) courses was not connected to increased grades in college.

Ewing (2006) created a summary of research on student outcomes regarding the AP program. She alluded to research on the following topics: AP teachers, the role of AP teachers in helping minority students, AP course enrollment, gender differences in AP, and predicting AP success. She stated that most research had been conducted to evaluate the impact of AP in predicting "college performance, college completion and performance on national or international assessments" (p. 1).Each of these studies was focused on the individual AP student or a group of AP students, but the impact of the AP program on students outside of the program was not addressed.

According to the results of the present study of high schools in the state of Florida, there was a significant correlation between AP participation and school-wide student achievement, and there was a significant correlation between AP performance and school-wide student achievement. These results support much of the research found in the literature review from Adelman, Klaric and others about the impact of AP on student achievement.

In the grand scheme of things, however, there are other variables that have a more significant relationship with school-wide student achievement than AP participation and performance. Poverty, in the form of free and reduced lunch, is one of these variables in the form of free and reduced lunch. The level of poverty found within a school had the most significant relationship found in this study. Furthermore, when the high schools were divided into three groups (the most affluent schools, the middle income schools, and

the poorest schools), one of the results contradicted earlier results. AP participation did have a significant relationship with school-wide student achievement when all of the schools in the state of Florida were considered, but when the poorest schools were analyzed as a group, the relationship between AP participation and school-wide student achievement became much less significant. Further research in this area is necessary before this contradictory result can be definitive. Nonetheless, it is an interesting result because the high-poverty schools are so much different in this relationship from the middle-class and upper-class schools.

What has become clear is that the number of students taking AP courses has increased and is likely to continue to increase based on 21st century educational and legislative policies. It is important, as educators, to research and consider the implications of the AP program to the future of the nation's schools and students.

APPENDIX A
HIGH SCHOOL GRADE POINTS AND VARIABLE DATA: 2007-2008

School Name	2008 Minority Rate	2008 Free/Reduced Lunch Rate	2008 School Grade Points (FCAT Only)	2008 School Grade	AP Performance 2008	AP Participation 2008
GAINESVILLE HIGH SCHOOL	51	34	528	B	41	34
NEWBERRY HIGH SCHOOL	36	46	459	C	35	15
SANTA FE HIGH SCHOOL	29	28	514	C	48	13
EASTSIDE HIGH SCHOOL	74	45	517	B	50	50
F. W. BUCHHOLZ HIGH SCHOOL	36	20	586	A	48	12
BAY HIGH SCHOOL	34	38	502	B	50	8
RUTHERFORD HIGH SCHOOL	40	34	512	B	48	33
A. CRAWFORD MOSLEY HIGH SCHOOL	12	17	581	A	50	49
J.R. ARNOLD HIGH SCHOOL	11	23	545	B	50	35
BRADFORD HIGH SCHOOL	28	40	463	C	50	11
TITUSVILLE HIGH SCHOOL	27	21	530	A	50	34
ASTRONAUT HIGH SCHOOL	19	20	542	B	50	29
ROCKLEDGE SENIOR HIGH SCHOOL	38	16	540	B	50	17
COCOA HIGH SCHOOL	43	37	497	C	38	29
VIERA HIGH SCHOOL	21	6	626	A	44	32
MELBOURNE SENIOR HIGH SCHOOL	22	14	595	A	50	26
PALM BAY SENIOR HIGH SCHOOL	45	27	550	A	50	18
BAYSIDE HIGH SCHOOL	44	34	539	B	41	18
EAU GALLIE HIGH SCHOOL	19	19	566	A	50	21
MERRITT ISLAND HIGH SCHOOL	17	11	572	A	41	29
SATELLITE SENIOR HIGH SCHOOL	11	8	617	A	45	32
SOUTH BROWARD HIGH SCHOOL	65	56	493	D	33	10
STRANAHAN HIGH SCHOOL	89	69	454	D	14	34
MCARTHUR HIGH SCHOOL	77	54	463	D	34	11
BLANCHE ELY HIGH SCHOOL	96	67	445	C	13	10
DILLARD HIGH SCHOOL	95	72	456	D	22	10
HALLANDALE HIGH SCHOOL	92	70	443	C	16	18
FORT LAUDERDALE HIGH SCHOOL	78	55	500	B	33	22
CORAL SPRINGS HIGH SCHOOL	59	38	519	B	37	16
NORTHEAST HIGH SCHOOL	62	48	482	C	41	10
NOVA HIGH SCHOOL	63	34	600	A	37	32
WILLIAM T. MCFATTER TECHNICAL CENTER	56	21	635	A	30	31
PLANTATION HIGH SCHOOL	82	50	469	C	15	16
HOLLYWOOD HILLS HIGH SCHOOL	60	52	458	C	33	9
COCONUT CREEK HIGH SCHOOL	85	57	388	F	14	13

School Name	2008 Minority Rate	2008 Free/Reduced Lunch Rate	2008 School Grade Points (FCAT Only)	2008 School Grade	AP Performance 2008	AP Participation 2008
DEERFIELD BEACH HIGH SCHOOL	75	53	492	C	40	20
BOYD H. ANDERSON HIGH SCHOOL	98	69	409	D	33	13
MIRAMAR HIGH SCHOOL	96	53	481	C	21	20
PIPER HIGH SCHOOL	75	46	451	D	22	14
COOPER CITY HIGH SCHOOL	30	10	598	A	43	26
SOUTH PLANTATION HIGH SCHOOL	70	43	477	C	35	16
J. P. TARAVELLA HIGH SCHOOL	52	27	527	A	34	21
WESTERN HIGH SCHOOL	33	16	543	A	32	21
MARJORY STONEMAN DOUGLAS HIGH SCHOOL	31	9	592	A	40	33
CHARLES W FLANAGAN HIGH SCHOOL	73	30	521	B	30	21
MONARCH HIGH SCHOOL	49	35	534	A	27	15
CYPRESS BAY HIGH SCHOOL	55	11	597	A	48	26
EVERGLADES HIGH SCHOOL	80	21	514	B	30	20
CORAL GLADES HIGH SCHOOL	54	32	542	A	30	20
CHARLOTTE HIGH SCHOOL	20	37	540	B	46	13
LEMON BAY HIGH SCHOOL	7	32	533	B	44	12
PORT CHARLOTTE HIGH SCHOOL	29	46	549	A	46	9
CITRUS HIGH SCHOOL	12	35	541	A	47	14
CRYSTAL RIVER HIGH SCHOOL	11	35	499	C	36	13
LECANTO HIGH SCHOOL	17	33	529	B	37	19
ORANGE PARK HIGH SCHOOL	42	25	527	B	32	20
CLAY HIGH SCHOOL	21	27	502	C	29	13
MIDDLEBURG HIGH SCHOOL	13	28	510	C	26	14
RIDGEVIEW HIGH SCHOOL	30	23	531	A	30	25
FLEMING ISLAND HIGH SCHOOL	18	7	605	A	41	24
NAPLES HIGH SCHOOL	35	23	527	A	44	29
LELY HIGH SCHOOL	58	42	432	D	34	18
IMMOKALEE HIGH SCHOOL	96	84	391	F	12	11
LORENZO WALKER TECHNICAL HIGH SCHOOL	55	43	425	D	9	12
BARRON COLLIER HIGH SCHOOL	23	13	582	A	38	35
GULF COAST HIGH SCHOOL	23	13	558	A	38	23
PALMETTO RIDGE HIGH SCHOOL	54	31	497	B	31	19
GOLDEN GATE HIGH SCHOOL	80	55	394	F	18	20
COLUMBIA HIGH SCHOOL	32	41	481	D	50	15
AMERICAN SENIOR HIGH SCHOOL	95	56	468	C	16	13
G. HOLMES BRADDOCK SENIOR HIGH	95	46	473	C	27	15
CORAL GABLES SENIOR HIGH SCHOOL	92	48	479	C	37	25
DESIGN & ARCHITECTURAL SENIOR HIGH	72	34	686	A	43	50
CORAL REEF SENIOR HIGH SCHOOL	79	34	635	A	38	50

School Name	2008 Minority Rate	2008 Free/Reduced Lunch Rate	2008 School Grade Points (FCAT Only)	2008 School Grade	AP Performance 2008	AP Participation 2008
HIALEAH SENIOR HIGH SCHOOL	98	65	439	C	33	11
JOHN A. FERGUSON SENIOR HIGH	92	39	524	B	37	24
HIALEAH-MIAMI LAKES SENIOR HIGH	97	65	434	D	22	12
DR MICHAEL M. KROP SENIOR HIGH	73	29	542	A	43	20
HOMESTEAD SENIOR HIGH SCHOOL	95	77	387	F	12	13
MIAMI BEACH SENIOR HIGH SCHOOL	82	58	523	B	32	19
MIAMI CAROL CITY SENIOR HIGH	99	66	360	F	2	9
MIAMI CENTRAL SENIOR HIGH SCHOOL	99	76	376	F	7	11
MIAMI CORAL PARK SENIOR HIGH	96	46	478	C	35	14
MIAMI JACKSON SENIOR HIGH SCHOOL	99	75	407	D	14	14
MIAMI KILLIAN SENIOR HIGH SCHOOL	78	31	504	B	29	29
ROBERT MORGAN EDUCATIONAL CENTER	81	43	552	A	22	22
MIAMI NORLAND SENIOR HIGH SCHOOL	99	62	374	F	5	8
MIAMI LAKES EDUCATIONAL CENTER	95	56	561	A	35	16
MIAMI NORTHWESTERN SENIOR HIGH	100	67	407	D	12	9
MIAMI PALMETTO SENIOR HIGH SCHOOL	60	17	560	A	37	36
MIAMI SENIOR HIGH SCHOOL	98	79	468	C	20	16
MIAMI SPRINGS SENIOR HIGH SCHOOL	93	49	507	B	33	8
MIAMI SUNSET SENIOR HIGH SCHOOL	89	45	506	B	20	18
NORTH MIAMI BEACH SENIOR HIGH	96	67	459	C	21	12
NORTH MIAMI SENIOR HIGH SCHOOL	99	52	375	F	25	14
WILLIAM H. TURNER TECHNICAL ARTS HIGH SCHOOL	99	68	487	C	23	12
SOUTH DADE SENIOR HIGH SCHOOL	84	66	398	D	17	13
SOUTH MIAMI SENIOR HIGH SCHOOL	92	57	467	D	28	18
MIAMI SOUTHRIDGE SENIOR HIGH	92	61	423	D	18	12
SOUTHWEST MIAMI SENIOR HIGH	92	51	506	B	24	20
BARBARA GOLEMAN SENIOR HIGH	96	48	481	C	30	14
FELIX VARELA SENIOR HIGH SCHOOL	90	45	520	B	32	15
BOOKER T. WASHINGTON SENIOR HIGH	99	81	395	D	8	18
NEW WORLD SCHOOL OF THE ARTS	68	19	615	A	41	34
CORPORATE ACADEMY SOUTH	90	62	376	F	0	0
DESOTO COUNTY HIGH SCHOOL	50	58	451	C	50	10
DIXIE COUNTY HIGH SCHOOL	10	56	487	C	50	11
PAXON SCHOOL/ADVANCED STUDIES	51	12	680	A	24	50
ENGLEWOOD HIGH SCHOOL	57	43	414	D	6	21
DOUGLAS ANDERSON SCHOOL OF THE ARTS	28	8	601	A	20	50
DUNCAN U. FLETCHER HIGH SCHOOL	25	16	544	A	29	50
SAMUEL W. WOLFSON HIGH SCHOOL	65	36	448	C	11	37
MANDARIN HIGH SCHOOL	33	11	526	B	16	50

School Name	2008 Minority Rate	2008 Free/Reduced Lunch Rate	2008 School Grade Points (FCAT Only)	2008 School Grade	AP Performance 2008	AP Participation 2008
FRANK H. PETERSON ACADEMIES	53	35	405	D	6	24
ESCAMBIA HIGH SCHOOL	44	51	470	D	38	10
PENSACOLA HIGH SCHOOL	69	65	485	C	44	45
J. M. TATE SENIOR HIGH SCHOOL	20	31	516	C	49	17
PINE FOREST HIGH SCHOOL	52	58	443	D	25	9
WASHINGTON SENIOR HIGH SCHOOL	47	42	510	B	47	20
NORTHVIEW HIGH SCHOOL	22	44	519	B	0	2
MATANZAS HIGH SCHOOL	28	25	542	A	28	17
FLAGLER-PALM COAST HIGH SCHOOL	32	31	532	A	49	14
EAST GADSDEN HIGH SCHOOL	98	74	415	D	48	10
PORT ST. JOE HIGH SCHOOL	25	28	534	A	50	14
WEWAHITCHKA HIGH SCHOOL	16	42	490	C	49	12
HARDEE SENIOR HIGH SCHOOL	57	59	447	D	37	12
LABELLE HIGH SCHOOL	61	53	477	C	50	8
CLEWISTON HIGH SCHOOL	69	56	435	C	38	8
FRANK W. SPRINGSTEAD HIGH SCHOOL	26	42	522	B	42	16
CENTRAL HIGH SCHOOL	24	43	466	D	48	19
NATURE COAST TECHNICAL HIGH	20	33	516	B	43	12
SEBRING HIGH SCHOOL	38	47	474	C	48	19
AVON PARK HIGH SCHOOL	58	60	424	D	45	13
LAKE PLACID HIGH SCHOOL	40	49	465	D	50	15
SPOTO HIGH SCHOOL	71	50	476	C	12	18
LENNARD HIGH SCHOOL	73	70	457	D	23	13
ARMWOOD HIGH SCHOOL	45	45	463	C	17	25
ALONSO HIGH SCHOOL	60	39	532	A	18	27
BLAKE HIGH SCHOOL-MAGNET	74	54	471	D	17	28
BRANDON HIGH SCHOOL	48	36	485	C	17	22
CHAMBERLAIN HIGH SCHOOL	61	57	451	C	24	24
DURANT HIGH SCHOOL	37	29	511	B	24	20
EAST BAY HIGH SCHOOL	52	39	479	C	20	19
FREEDOM HIGH SCHOOL	48	33	537	A	33	24
GAITHER HIGH SCHOOL	44	28	561	A	24	28
HILLSBOROUGH HIGH SCHOOL	74	57	534	A	40	45
KING HIGH SCHOOL	71	42	517	B	50	44
LETO HIGH SCHOOL	83	70	441	C	10	16
MIDDLETON HIGH SCHOOL	86	66	419	D	21	19
NEWSOME HIGH SCHOOL	26	11	586	A	29	33
RIVERVIEW HIGH SCHOOL	44	28	541	A	20	22
PLANT HIGH SCHOOL	30	13	622	A	31	46
PLANT CITY HIGH SCHOOL	40	41	500	B	22	27

School Name	2008 Minority Rate	2008 Free/Reduced Lunch Rate	2008 School Grade Points (FCAT Only)	2008 School Grade	AP Performance 2008	AP Participation 2008
ROBINSON HIGH SCHOOL	50	42	523	B	18	32
JEFFERSON HIGH SCHOOL	86	61	496	B	27	15
BLOOMINGDALE HIGH SCHOOL	36	18	567	A	31	33
SICKLES HIGH SCHOOL	34	12	598	A	35	23
TAMPA BAY TECH HIGH SCHOOL	78	54	547	A	16	35
WHARTON HIGH SCHOOL	62	37	523	B	25	22
HOLMES COUNTY HIGH SCHOOL	10	54	505	B	50	7
SEBASTIAN RIVER HIGH SCHOOL	33	40	516	B	46	21
MARIANNA HIGH SCHOOL	35	33	501	C	50	13
EUSTIS HIGH SCHOOL	34	34	506	C	44	11
LEESBURG HIGH SCHOOL	38	39	467	D	16	25
MT. DORA HIGH SCHOOL	32	34	520	B	30	14
TAVARES HIGH SCHOOL	23	28	524	B	46	14
UMATILLA HIGH SCHOOL	12	41	525	B	46	10
SOUTH LAKE HIGH SCHOOL	36	28	479	D	25	14
EAST RIDGE HIGH SCHOOL	49	32	499	B	45	13
FORT MYERS HIGH SCHOOL	33	22	597	B	50	41
LEHIGH SENIOR HIGH SCHOOL	66	59	467	C	41	5
NORTH FORT MYERS HIGH SCHOOL	25	33	525	A	50	13
SOUTH FORT MYERS HIGH SCHOOL	44	36	504	B	44	5
CYPRESS LAKE HIGH SCHOOL	29	27	562	A	38	16
CAPE CORAL HIGH SCHOOL	45	45	517	B	32	11
MARINER HIGH SCHOOL	37	38	495	B	25	14
ESTERO HIGH SCHOOL	38	31	448	C	19	10
DUNBAR HIGH SCHOOL	80	67	514	B	36	14
IDA S. BAKER HIGH SCHOOL	30	30	516	B	25	13
LEON HIGH SCHOOL	34	18	537	A	41	37
JAMES RICKARDS HIGH SCHOOL	86	50	468	C	35	38
AMOS P. GODBY HIGH SCHOOL	67	45	437	C	33	9
SAIL	17	16	542	A	50	19
LINCOLN HIGH SCHOOL	40	13	557	A	33	38
LAWTON CHILES HIGH SCHOOL	18	4	614	A	48	37
CHIEFLAND HIGH SCHOOL	19	44	510	B	32	8
WILLISTON HIGH SCHOOL	32	48	472	C	44	10
LIBERTY COUNTY HIGH SCHOOL	17	38	518	C	50	12
MADISON COUNTY HIGH SCHOOL	55	57	420	D	47	14
BAYSHORE HIGH SCHOOL	38	46	481	D	14	7
MANATEE HIGH SCHOOL	31	30	539	A	30	22
PALMETTO HIGH SCHOOL	48	45	443	D	22	17
SOUTHEAST HIGH SCHOOL	59	55	468	D	40	21

School Name	2008 Minority Rate	2008 Free/Reduced Lunch Rate	2008 School Grade Points (FCAT Only)	2008 School Grade	AP Performance 2008	AP Participation 2008
LAKEWOOD RANCH HIGH SCHOOL	16	15	569	A	35	16
BRADEN RIVER HIGH SCHOOL	28	24	537	A	22	18
NORTH MARION HIGH SCHOOL	37	53	503	B	25	6
FOREST HIGH SCHOOL	33	32	531	A	37	9
VANGUARD HIGH SCHOOL	40	41	529	A	50	24
LAKE WEIR HIGH SCHOOL	33	60	509	B	17	11
DUNNELLON HIGH SCHOOL	48	52	499	C	17	11
BELLEVIEW HIGH SCHOOL	26	37	526	A	50	3
WEST PORT HIGH SCHOOL	47	46	513	C	19	16
MARTIN COUNTY HIGH SCHOOL	24	20	574	B	42	31
SOUTH FORK HIGH SCHOOL	32	25	561	B	40	34
JENSEN BEACH HIGH SCHOOL	17	14	607	A	37	26
KEY WEST HIGH SCHOOL	41	28	518	B	32	21
WEST NASSAU COUNTY HIGH SCHOOL	9	22	512	B	31	25
YULEE HIGH SCHOOL	17	27	457	D	27	10
FERNANDINA BEACH HIGH SCHOOL	19	18	535	A	41	24
NICEVILLE SENIOR HIGH SCHOOL	15	10	619	A	40	37
CHOCTAWHATCHEE SENIOR HIGH SCHOOL	29	23	561	B	26	46
CRESTVIEW HIGH SCHOOL	26	22	560	A	22	37
FORT WALTON BEACH HIGH SCHOOL	26	18	588	A	36	28
OKEECHOBEE HIGH SCHOOL	37	41	445	D	44	10
BOONE HIGH SCHOOL	40	25	538	A	47	19
EDGEWATER HIGH SCHOOL	63	38	487	C	28	23
OCOEE HIGH SCHOOL	62	36	478	C	13	16
COLONIAL HIGH SCHOOL	79	53	449	C	32	13
EVANS HIGH SCHOOL	97	66	421	D	8	10
OAK RIDGE HIGH SCHOOL	90	57	434	D	5	23
DR. PHILLIPS HIGH SCHOOL	58	28	543	A	38	29
UNIVERSITY HIGH SCHOOL	65	38	491	D	21	34
WINTER PARK HIGH SCHOOL	39	23	588	A	41	38
WEST ORANGE HIGH SCHOOL	54	29	500	C	30	15
APOPKA HIGH SCHOOL	55	34	498	B	31	16
WEKIVA HIGH SCHOOL	65	45	465	C	16	24
TIMBER CREEK HIGH SCHOOL	49	28	533	B	36	25
OLYMPIA HIGH SCHOOL	52	21	547	A	33	34
CYPRESS CREEK SENIOR HIGH SCHOOL	82	47	470	D	26	36
FREEDOM HIGH SCHOOL	68	39	459	D	23	17
JONES HIGH SCHOOL	99	78	409	D	10	24
ROBERT HUNGERFORD PREP. HIGH	88	64	437	D	50	11
OSCEOLA HIGH SCHOOL	71	64	476	C	50	20

School Name	2008 Minority Rate	2008 Free/Reduced Lunch Rate	2008 School Grade Points (FCAT Only)	2008 School Grade	AP Performance 2008	AP Participation 2008
GATEWAY HIGH SCHOOL	87	69	463	D	36	23
POINCIANA HIGH SCHOOL	81	67	409	D	16	25
LIBERTY HIGH SCHOOL	88	72	410	D	9	24
PROFESSIONAL & TECHNICAL HIGH	87	69	577	A	50	17
CELEBRATION HIGH SCHOOL	56	49	490	D	27	17
HARMONY HIGH SCHOOL	24	30	523	B	13	34
JUPITER HIGH SCHOOL	18	8	598	A	45	22
SUNCOAST COMMUNITY HIGH SCHOOL	54	16	646	A	49	50
ALEXANDER W DREYFOOS JUNIOR SCHOOL OF THE ARTS	33	11	671	A	40	50
FOREST HILL COMMUNITY HIGH SCHOOL	79	54	484	C	32	14
LAKE WORTH HIGH SCHOOL	81	57	457	C	31	19
ATLANTIC HIGH SCHOOL	73	41	481	C	50	31
BOCA RATON COMMUNITY HIGH SCHOOL	39	23	610	A	37	39
JOHN I. LEONARD HIGH SCHOOL	76	50	477	C	24	11
PALM BEACH GARDENS HIGH SCHOOL	68	53	494	C	28	23
SANTALUCES COMMUNITY HIGH	70	44	450	C	33	12
SPANISH RIVER COMMUNITY HIGH SCHOOL	27	9	620	A	45	32
PALM BEACH LAKES HIGH SCHOOL	96	60	447	C	28	15
PARK VISTA COMMUNITY HIGH SCHOOL	37	13	565	A	31	19
OLYMPIC HEIGHTS COMMUNITY HIGH	45	24	544	A	34	17
WELLINGTON HIGH SCHOOL	34	13	600	A	44	25
WILLIAM T. DWYER HIGH SCHOOL	47	27	550	A	32	23
GLADES CENTRAL HIGH SCHOOL	99	89	390	F	30	11
ROYAL PALM BEACH HIGH SCHOOL	63	31	461	C	27	11
BOYNTON BEACH COMMUNITY HIGH	89	50	396	D	13	10
PALM BEACH CENTRAL HIGH SCHOOL	49	20	557	A	39	18
WEST BOCA RATON HIGH SCHOOL	26	12	587	A	39	29
SEMINOLE RIDGE COMMUNITY HIGH SCHOOL	32	15	560	A	27	14
PASCO HIGH SCHOOL	34	51	503	B	45	15
JAMES W. MITCHELL HIGH SCHOOL	16	28	522	B	36	16
WIREGRASS RANCH HIGH SCHOOL	46	27	512	C	22	19
SUNLAKE HIGH SCHOOL	33	21	522	B	35	10
ZEPHYRHILLS HIGH SCHOOL	19	44	507	B	49	9
GULF HIGH SCHOOL	18	48	491	C	24	17
RIVER RIDGE HIGH SCHOOL	12	30	507	B	46	15
HUDSON HIGH SCHOOL	9	47	477	C	44	13
LAND O' LAKES HIGH SCHOOL	26	17	568	B	45	22
RIDGEWOOD HIGH SCHOOL	20	53	489	D	47	10

School Name	2008 Minority Rate	2008 Free/Reduced Lunch Rate	2008 School Grade Points (FCAT Only)	2008 School Grade	AP Performance 2008	AP Participation 2008
BOCA CIEGA HIGH SCHOOL	56	44	404	D	16	22
CLEARWATER HIGH SCHOOL	31	33	472	C	30	17
COUNTRYSIDE HIGH SCHOOL	26	23	488	C	49	12
DIXIE M. HOLLINS HIGH SCHOOL	36	41	431	D	34	6
DUNEDIN HIGH SCHOOL	28	27	493	C	30	18
GIBBS HIGH SCHOOL	66	49	405	D	26	23
LAKEWOOD HIGH SCHOOL	63	34	488	D	38	20
LARGO HIGH SCHOOL	31	32	463	C	44	8
NORTHEAST HIGH SCHOOL	31	37	417	D	29	9
OSCEOLA HIGH SCHOOL	16	22	504	B	32	12
PINELLAS PARK HIGH SCHOOL	35	41	458	C	45	13
ST. PETERSBURG HIGH SCHOOL	39	27	537	B	46	29
SEMINOLE HIGH SCHOOL	11	14	510	B	49	14
TARPON SPRINGS HIGH SCHOOL	19	22	494	D	32	19
PALM HARBOR UNIVERSITY HIGH	17	11	618	A	50	32
EAST LAKE HIGH SCHOOL	15	10	577	A	43	22
LAKELAND SENIOR HIGH SCHOOL	41	39	473	D	33	19
WINTER HAVEN SENIOR HIGH SCHOOL	47	45	455	C	24	13
AUBURNDALE SENIOR HIGH SCHOOL	30	45	487	C	37	11
BARTOW SENIOR HIGH SCHOOL	38	37	488	C	45	31
RIDGE COMMUNITY HIGH SCHOOL	67	55	426	D	12	31
MULBERRY SENIOR HIGH SCHOOL	34	51	446	C	26	8
KATHLEEN SENIOR HIGH SCHOOL	52	59	446	C	13	11
LAKE GIBSON SENIOR HIGH SCHOOL	36	42	498	B	29	6
HAINES CITY SENIOR HIGH SCHOOL	74	67	439	C	18	7
GEORGE W. JENKINS SENIOR HIGH	30	25	512	B	31	14
LAKE REGION HIGH SCHOOL	44	44	467	D	36	12
INTERLACHEN HIGH SCHOOL	25	60	471	C	50	11
PALATKA HIGH SCHOOL	39	46	462	C	50	17
ST. AUGUSTINE HIGH SCHOOL	25	30	528	B	43	12
ALLEN D NEASE SENIOR HIGH SCHOOL	12	4	626	A	42	42
PEDRO MENENDEZ HIGH SCHOOL	17	23	541	B	36	27
BARTRAM TRAIL HIGH SCHOOL	13	3	605	A	37	31
FORT PIERCE CENTRAL HIGH SCHOOL	75	69	443	C	47	15
FORT PIERCE WESTWOOD HIGH SCHOOL	68	65	445	D	27	15
PORT ST. LUCIE HIGH SCHOOL	48	47	480	C	38	10
ST. LUCIE WEST CENTENNIAL HIGH	48	42	468	C	22	26
TREASURE COAST HIGH SCHOOL	56	40	456	C	38	7
GULF BREEZE HIGH SCHOOL	6	10	606	A	50	41
MILTON HIGH SCHOOL	19	34	500	C	50	21

School Name	2008 Minority Rate	2008 Free/Reduced Lunch Rate	2008 School Grade Points (FCAT Only)	2008 School Grade	AP Performance 2008	AP Participation 2008
PACE HIGH SCHOOL	10	17	571	A	50	26
NAVARRE HIGH SCHOOL	19	15	547	A	45	18
SARASOTA HIGH SCHOOL	23	24	497	C	42	11
BOOKER HIGH SCHOOL	56	44	465	C	27	11
RIVERVIEW HIGH SCHOOL	22	21	573	A	44	31
VENICE SENIOR HIGH SCHOOL	8	20	541	A	34	17
NORTH PORT HIGH SCHOOL	25	41	504	B	37	5
LAKE MARY HIGH SCHOOL	40	26	550	B	38	26
SEMINOLE HIGH SCHOOL	52	35	528	A	36	33
CROOMS ACADEMY OF INFORMATION TECHNOLOGY	50	36	582	A	45	40
OVIEDO HIGH SCHOOL	25	15	601	A	40	27
LYMAN HIGH SCHOOL	40	31	536	B	30	29
LAKE BRANTLEY HIGH SCHOOL	36	19	561	A	35	28
LAKE HOWELL HIGH SCHOOL	42	30	570	A	36	22
WINTER SPRINGS HIGH SCHOOL	32	24	566	B	41	27
HAGERTY HIGH SCHOOL	30	12	597	A	27	50
WILDWOOD HIGH SCHOOL	48	62	508	B	50	5
SOUTH SUMTER HIGH SCHOOL	25	50	528	A	50	7
SUWANNEE HIGH SCHOOL	27	41	456	C	25	16
TAYLOR COUNTY HIGH SCHOOL	29	39	505	B	50	9
UNION COUNTY HIGH SCHOOL	19	42	443	D	50	14
DELAND HIGH SCHOOL	30	29	527	A	39	32
MAINLAND HIGH SCHOOL	50	42	492	C	21	17
NEW SMYRNA BEACH HIGH SCHOOL	13	29	526	A	38	21
SPRUCE CREEK HIGH SCHOOL	17	15	590	A	50	41
ATLANTIC HIGH SCHOOL	31	32	474	C	43	7
SEABREEZE HIGH SCHOOL	17	18	507	C	31	20
DELTONA HIGH SCHOOL	43	37	485	C	35	14
PINE RIDGE HIGH SCHOOL	46	42	456	C	36	10
WAKULLA HIGH SCHOOL	15	26	571	A	35	10
FREEPORT SENIOR HIGH SCHOOL	6	42	543	A	50	27
SOUTH WALTON HIGH SCHOOL	10	16	549	A	24	19
WALTON SENIOR HIGH SCHOOL	22	45	507	C	50	17
CHIPLEY HIGH SCHOOL	22	35	489	D	50	16
VERNON HIGH SCHOOL	21	53	451	C	47	7

APPENDIX B
INSTITUTIONAL REVIEW BOARD EXEMPTION

University of Central Florida Institutional Review Board
Office of Research & Commercialization
12201 Research Parkway, Suite 501
Orlando, Florida 32826-3246
Telephone: 407-823-2901, 407-882-2012 or 407-882-2276
www.research.ucf.edu/compliance/irb.html

From : UCF Institutional Review Board
FWA00000351, Exp. 5/07/10, IRB00001138

To : David Christiansen

Date : July 24, 2009

RE: Public Data for Research

As per your e-mail correspondence, the UCF IRB Office has determined that your project does not meet the definition of human subjects research and, therefore, will not require Institutional Review Board (IRB) review/approval. According to the information you provided in your email, you will be utilizing publicly available data from the Florida Department of Education website and the College Board website.

Thank you for your time in resolving this issue. Please continue to submit inquiries or applications that involve human subject activities that could potentially involve human subjects as research participants.

If you have questions, please phone the IRB office at 407-823-2901.

On behalf of Sophia Dziegielewski, Ph.D., UCF IRB Vice-chair, this letter is signed by:

Janice Turchin
UCF IRB Coordinator

cc: IRB file

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