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Achievement For Advancement Via Individual Determination (avid) Students And Non-avid Students In Select Central Florida High Schools In 2007-2009: A Comparative Study

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ACHIEVEMENT FOR ADVANCEMENT VIA INDIVIDUAL DETERMINATION (AVID) STUDENTS AND NON-AVID STUDENTS IN SELECT CENTRAL FLORIDA HIGH SCHOOLS IN 2007-2009: A COMPARATIVE STUDY

by

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ABSTRACT

The focus of this study was to examine the relationship of student participation in the Advancement Via Individual Determination (AVID) program and student academic performance. More specifically, this study was conducted to determine if there was a mean difference in student performance on the Florida Comprehensive Assessment Test (FCAT) in mathematics, reading, and writing between students who participated in the AVID program during their first two years of high school and students who had similar demographics (e.g., ethnicity, gender, and economic status) but did not participate in the AVID program for 2007-2009.

The population for this study consisted of students from six high schools with certified AVID programs during the 2007-2008 and 2008-2009 school years in two central Florida school districts. Students participating in the AVID program were matched with non-AVID participants for each school site by ethnicity, gender, socioeconomic status, and tenth grade mathematics or English course.

The results of this study did not indicate statistically significant differences in the FCAT mathematics and reading developmental scale score gains between the AVID and non-AVID students. However, the non-AVID students performed significantly higher on the tenth grade writing component of the FCAT. Participation in the AVID program produced no statistically significant findings for the factors of gender, ethnicity, and socioeconomic status for FCAT mathematics, reading, or writing. The findings indicated that AVID and non-AVID students could not be differentiated by FCAT performance measures in the mathematics and reading domains.

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Introduction

According to Nelson (2009), "the greatness and strength of a country can be measured in a number of ways. As educators, we know that the most important factor in the success or failure of a country is the level and quality of education its citizens receive" (p. 3). Under the No Child Left Behind (NCLB) Act of 2001, states have been held accountable for making sure that all students reach academic proficiency. Federal funding is available to support educational programs and practices that, through rigorous research, have been proven to increase student achievement (NCLB, 2002). In order to prevent students from dropping out of school and to address the issue of students graduating from high school unprepared for postsecondary education, school leaders have implemented programs that spark student interest and help to ensure that students are college-ready.

While several programs have existed to ensure student success, one program that has targeted students in the academic middle at the middle school and high school levels is the Advancement Via Individual Determination (AVID) program. AVID was founded in 1980 by Mary Catherine Swanson, an English teacher at Clairemont High School in San Diego, California. She originally created AVID as a way to prepare underachieving disadvantaged students to attend college (Swanson, 1989).

According to Arellanes, Bishop, and Castruita (2007), The mission of AVID is "to ensure that all students, and most especially the least served students who are in the middle:

1. will succeed in rigorous curriculum,
2. will complete a rigorous college preparatory path,

3. will enter mainstream activities of the school,
4. will increase their enrollment in four-year colleges, and
5. will become educated and responsible participants and leaders in a democratic society" (p.5).

AVID

The Beginning of AVID

As described by the founder (Swanson, 1989), AVID began in 1980 to prepare underachieving, disadvantaged students to attend college. Swanson served as her school's chair of the English department. As a result of court-ordered desegregation in the San Diego Unified School District and the addition of a new high school, the student population changed from a homogeneous middle class population to one that included over 500 low income Latino and Black students. She believed that given the opportunity, these students would be successful in a college preparatory curriculum and would graduate high school prepared to succeed in college (Swanson, Mehan, & Hubbard, 1993).

The AVID Student

Swanson (2005) described potential AVID students as those students in the middle who tend to be forgotten. She described the forgotten-middle as "the silent majority--the kids who come to school regularly, sit in the back of the class, rarely say anything, don't cause trouble, and get by with C's" (p. 31). Swanson stated that these students are the majority because they take up a large part of the middle two quartiles. They will graduate from high school but will not be prepared for college.

Swanson (2005) advocated for a detracking program that would make all students college ready. She stated, "We must start by abandoning the mind-set that labels so many students as not being college material. The expectation ought to be that all students, with few exceptions, will complete the rigorous course loads needed to get into a four-year college" (p. 33).

The AVID Elective Class

At the high school level, AVID students have typically been enrolled in rigorous academic courses such as honors, Advanced Placement (AP), and International Baccalaureate (IB) classes. Support has been provided to these students during an AVID elective class. Students are enrolled in the elective class each year they participate in the AVID program. The content in the AVID elective class consists of skill related behaviors such as studying, taking tests, managing time, preparing for college entrance exams, and developing research and reading skills. The curriculum also addresses writing, inquiry, collaboration, and reading strategies (Arellanes et al., 2007).

AVID Instructional Methodologies

Arellanes et al. (2007) reported that the following methodologies are utilized in the AVID program: (a) writing as a tool of learning, (b) inquiry method, (c) collaborative, subject-specific learning groups, and (d) reading as a tool of learning. They stated that these methodologies, labeled WICR (writing, inquiry, collaborative, reading) strategies, "help students prepare for--and participate in--a rigorous college-preparatory curriculum" (p. 35).

The AVID Essentials

Arellanes et al. (2007) stated that in order to use the AVID trade name, trademark, and logo, schools must adhere to the following 11 program essentials:

1. "AVID student selection must focus on students in the middle (2.0 to 3.5 G.P.A. as one indicator) with academic potential, who would benefit from AVID support to improve their academic record and begin college preparation" (Arellanes et al., 2007, p. 55).

Arellanes et al. emphasized that although the AVID elective curriculum would benefit any student, it was designed for the underachieving student. Students currently succeeding in rigorous courses may not see the benefit of AVID and, therefore, would view it as a waste of time. Additionally, students who are academically at-risk would also benefit from AVID but would be unlikely to achieve success in rigorous courses required for college admission. Therefore, "the most effective and rewarding application of the program is to use it to target students in the middle who are presently underachieving, but who have the desire and potential to succeed in rigorous courses" (Arellanes et al., p.55). These students, when placed with other high achieving students in rigorous courses and provided with support from the AVID elective class, will "make significant gains in their academic achievement" (p. 55).

2. "AVID program participants, both students and staff, *must choose to participate"* (Arellanes et al., 2007, p. 55).

There has been a great deal of emphasis on voluntary participation of students and teachers in the program, as participation takes time and commitment. Parents must also

give students permission to participate and are encouraged to attend conferences and AVID events (Arellanes et al.).

3. "The school must be committed to full implementation of the AVID program, with the AVID elective class available within the regular academic school day" (Arellanes et al., 2007, p. 56).

The AVID elective class is considered to be essential for AVID students' academic success. The elective class provides students with the support needed to increase their chances of academic success and college readiness. Students are provided with a support system and an opportunity to be part of a team committed to high academic achievement and social growth. As a result of the strong personal relationships created through participation in the AVID class, student difficulties can be identified quickly and processes can be put into place that will remedy the situation and enhance student success (Arellanes et al., 2007).

4. "AVID students must be enrolled in a rigorous course of study that will enable them to meet requirements for university enrollment" (Arellanes et al., 2007, p. 56).

The goal of the AVID program is to prepare students for four-year college enrollment. Therefore, students must be enrolled in a college preparatory program of study. The AVID elective teacher is required to collaborate with the guidance counselor to ensure that AVID students are enrolled in the correct courses for college entrance. In addition to providing students with exposure to college and career expectations, the AVID elective teacher must provide students with practice in test taking strategies that will enhance their success on tests such as the Preliminary Scholastic Aptitude Test (PSAT®), Scholastic Aptitude Test (SAT®), and/or ACT. The AVID elective teacher

must set high expectations for students and help them move beyond their current levels of achievement.

According to Arellanes et al. (2007), the AVID class not only provides tutorial support to students in specific content area needs but it also must provide:

a. Direct instruction in and practice with study skills strategies, including time management, assignment and grade recording, tutorial logs, and binder organization.
b. College and career awareness, college-entry skills, and test taking strategies (e.g., PLAN, PSAT®, ACT's Explore, SAT®, ACT).
c. Binder notes regularly evaluated by tutors/teacher (p. 57).

5. "A strong relevant writing and reading curriculum provides a basis for instruction in the AVID elective class" (Arellanes et al., 2007, p. 57).

Students are provided with instruction in various writing strategies. Those required include Cornell note taking, learning logs, letter writing, and essays. Students are also instructed in reading-to-learn strategies such as connecting to prior knowledge, understanding text structure, and other text-processing strategies to ensure successful comprehension of challenging text (Arellanes et al., 2007).

6. "Inquiry is used as a basis for instruction in the AVID classroom" (Arellanes et al., 2007, p. 57).

Students are instructed in higher order questioning techniques and utilize those skills in tutorials and Socratic seminars. The Socratic seminar is a process where students sit in a circle and explore and take responsibility for their learning of a particular topic by challenging the viewpoints of others and eventually developing their own perspective. Student viewpoints must be supported by relevant evidence. The seminar leader acts as a facilitator and helps students clarify their thinking through questioning but does not offer their opinions or views in this process (Ball & Brewer, 2000).

7. “Collaboration is used as a basis for instruction in the AVID classroom” Arellanes et al., 2007, p. 57).

Students are trained in group processes and how to work collaboratively. They learn to take responsibility for their own learning and how to assist others in the learning process.

8. “A sufficient number of tutors must be available in the AVID class to facilitate student access to rigorous curriculum. Tutors should be students from colleges and universities and must be trained to implement the methodologies used in AVID” (Arellanes et al., 2007, p. 58).

The use of tutors in the AVID elective class is essential to provide the support needed to students not previously exposed to a rigorous college-preparatory curriculum. Tutors must be trained in the use of the AVID methodologies. Training materials are provided through AVID and supported through the AVID regional office. Although it is highly recommended that tutors are current college students, schools may employ other tutors if necessary. AVID recommends a tutor-student ratio of 1:7 (Arellanes et al., 2007).

9. “AVID program implementation and student progress must be monitored through the AVID Data System, and results must be analyzed to ensure success” (Arellanes et al., 2007, p. 58).

Student performance data must be recorded and analyzed through the AVID Data System to monitor student progress and assist in the continuous evaluation of the program’s effectiveness.

10. “The school or district must identify resources for program costs, agree to implement the AVID Program Implementation Essentials and participate in AVID certification, and commit to ongoing participation in AVID staff development” (Arellanes et al., 2007, p. 58).

The AVID Summer Institute is the main avenue for professional development, and participation by all team members is critical. The team consists of the AVID elective teacher, core subject area teachers, guidance counselor, and the AVID site administrator. The school or district must allocate resources for professional development, program materials, and tutors.

11. “An active, interdisciplinary site team collaborates on issues of student access to and success in rigorous college-preparatory courses” (Arellanes et al., 2007, p. 59).

Arellanes et al. (2007) stated, “A strong, effective AVID team is a leadership group that fosters the development of a school wide learning community, collaborates to achieve the mission of AVID, and focuses on the achievement of all its students” (p. 59).

The AVID site team is responsible for developing and implementing the site plan and for documenting evidence that shows support for students’ access and success in a rigorous curriculum. The team should meet on a regular basis to discuss the needs of AVID students and to monitor their progress. The team is also responsible for setting goals to implement the AVID methodologies school wide and for developing and implementing a plan to create a school culture that supports the AVID mission (Arellanes et al., 2007).

Guthrie and Guthrie (2002) conducted a study of eight successful high school AVID programs in California and reported on the best practices of AVID. One key

finding in the study was that all eight programs followed the AVID program almost exactly as it was designed. They noted that all programs maintained the 11 essentials and reported that as a result, students took more responsibility for their learning and had a greater chance of college readiness and college success (Guthrie & Guthrie).

Research on AVID

Research on AVID conducted in California and Texas has shown that AVID benefits the students directly involved in the program as well as the schools implementing the program (Mehan, Hubbard, Lintz, & Villanueva, 1994; Oswald, 2001; Watt, Powell, Mendiola, & Cossio, 2006). Furthermore, studies on AVID have also shown that favorable outcomes existed for students of all ethnic groups participating in the AVID program (Foy, 2002; Hale, 2006).

According to Mehan et al. (1994), the college enrollment record of students who have participated in AVID provides some evidence to support the idea that underrepresented students can participate in an academic curriculum as an alternative to the common practice of placing these students in vocational or general education tracks. Nelson (2007) stated that something remarkable happens when educators begin to extend college-preparatory opportunities and support to more students and that students rise to the challenge and succeed at higher rates than they did in remedial and general education tracks. Mehan et al. (1994) reported that enrolling in AVID provides low-income students the social and cultural capital at school that more economically advantaged children receive at home.

Oswald (2001) completed a program evaluation of AVID in the Austin Independent School District (AISD) in Texas. AVID programs serving nearly 400

students in eight schools were evaluated using multiple techniques. After analyzing student data; surveying teachers, counselors, and administrators; conducting informal observations; and conducting in-depth interviews, she reported that AVID students showed greater participation in advanced classes, were more involved in school activities, and passed the Texas Assessment of Academic Skills exit examination at high rates, ultimately meeting the program goals. However, in a quantitative study comparing the performance of 48 AVID students from four schools in the Pine View School District in Colorado with a matched set of non-AVID students from the same four schools in the areas of reading, writing, and mathematics, Rorie (2007) found no significant difference on the ninth and tenth grade Colorado Student Assessment Program, the Plan test, the ACT, or the eleventh grade writing assessment.

Watt et al. (2006) conducted a study over a four-year period comparing 10 Texas high schools in five districts that implemented the AVID program as part of a comprehensive school reform with non-AVID high schools. The study was conducted to determine if school-wide or district-wide accountability measures improved for AVID high schools and districts compared to non-AVID high schools and districts. Researchers found schools and districts that implemented AVID showed that student performance improved over four years of AVID implementation. However, even though the non-AVID schools and districts had similar student demographics, they did not show similar improvements.

Watt, Huerta, and Lozano (2007) conducted a comparison study of AVID and Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR UP) for tenth grade students in two high schools in the Rio Grande Valley of Texas. The purpose

of this study was to investigate if a difference existed in the preparedness of students who did and did not participate in college preparatory programs. Four groups of students were examined: 40 students in AVID, 40 students in GEAR UP, 22 students in both AVID and GEAR UP, and a control group of 40 students not in either program. It was hypothesized that AVID and GEAR UP students would exhibit higher levels of academic preparation, educational expectations and anticipations, and knowledge of college entrance requirements. The preliminary findings were inconclusive. The authors reported that only the AVID group was significantly better in academic preparation than the control group. The other two groups that participated in college preparatory programs were not significantly better in academic preparation than the control group. AVID students were enrolled in more advanced course work than the other groups.

Other research on AVID included studies that measure factors other than student performance. One study focused on the aspects of the AVID program that contributed to students remaining in the program for all four years of high school. The authors noted that students remained in the AVID program because of strong personal relationships that were developed with the AVID teachers and the family-like atmosphere that contributed to positive student morale and self-esteem. In this study, it was also noted that students believed that tutoring was one of the advantages for staying in the program (Watt, Johnston, Huerta, Mendiola, & Alkan, 2008).

Purpose of the Study

The purpose of this study was to examine the relationship of student participation in AVID and student academic performance. More specifically, this study was conducted to determine if there was a relationship in student performance on the Florida

Comprehensive Assessment Test (FCAT) in mathematics, reading, and writing and participation in the AVID program during the first two years of high school. A comparison of FCAT performance of AVID students and non-AVID students who had similar demographics (e.g., race, gender, and socioeconomic status) was made.

Statement of the Problem

During times when resources for education are scarce, educational leaders make decisions regarding implementation of programs that will have the greatest impact on student achievement. Because programs can be relatively expensive, leaders are charged with the task of determining what programs are effective in improving student achievement and worthy of investment of resources.

For example, the AVID program has required a considerable amount of financial and human resources. General cost information was provided by the Assistant Director of Marketing and Communications at the AVID Center Headquarters who reported that AVID can cost a district nearly $30,000 for one school site for one school year (S. Baratte, personal communication, July 24, 2009). This cost includes a membership fee, curriculum materials, staff development, summer institute trainings, and a professional service fee for support and training. More detailed financial information was considered by AVID to be confidential between AVID and participating districts or schools and was not available for this study. Therefore, the problem addressed in this study was to determine the extent to which student participation in the AVID program related to student achievement in mathematics, reading, and writing as measured by the FCAT in selected Central Florida high schools.

Research Questions

The following research questions guided this study of students in selected Central Florida high school certified AVID programs:

1 To what extent is there a mean difference from eighth to tenth grade FCAT mathematics developmental scale score gains for students based on participation in AVID, and their ethnicity, gender, and economic status?

2 To what extent is there a mean difference from eighth to tenth grade FCAT reading developmental scale score gains for students based on participation in AVID, and their ethnicity, gender, and economic status?

3 To what extent is there a mean difference in tenth grade FCAT writing scores for students based on participation in AVID, and their ethnicity, gender, and economic status?

Definition of Terms

The following definitions of terms are provided to clarify their use in the study:

Advancement Via Individual Determination (AVID) Participation--For the purpose of this study, AVID participants were defined as students who have been continuously enrolled in the AVID program, including the AVID elective class, during ninth and tenth grade in the 2007-2008 and 2008-2009 school years.

Certified AVID Program--According to AVID Center (2006), schools that have implemented all 11 AVID Essentials at the Certification Standard Level (a rating of at least a 1 for each essential on a scale of 0-3) are granted certification status. This ensures that the program has been implemented with fidelity.

Continuously Enrolled--For the purpose of this study, continuously enrolled was defined as students in attendance at the same high school during 9th and tenth grades for the 2007-2008 and 2008-2009 school years.

Economically disadvantaged-- For the purpose of this study, economically disadvantaged was measured by participation in the free and reduced lunch program.

Ethnicity-- For the purpose of this study, students were categorized by ethnicity as either White or Non-White.

Florida Comprehensive Assessment Test (FCAT)--"The Florida Comprehensive Assessment Test (FCAT) is part of Florida's overall plan to increase student achievement by implementing higher standards. The FCAT, administered to students in Grades 3-11, consists of criterion-referenced tests (CRT) in mathematics, reading, science, and writing, which measure student progress toward meeting the Sunshine State Standards (SSS) benchmarks" (Florida Department of Education, 2009).

FCAT Developmental Scale Score for Mathematics and Reading--"Developmental Scale Scores (DSS) are only reported for FCAT SSS Reading and Mathematics and range from 0 to about 3000 across grades 3 through 10. DSS link two years of student FCAT data that track student progress over time. Students should receive higher scores as they move from grade-to-grade according to their increased achievement" (Florida Department of Education, 2008, p.1).

FCAT Writing Score--FCAT Writing scores range from 1 to 6 with 1 being the lowest and 6 being the highest. Each student receives an individual score for his or her essay (Florida Department of Education, 2008).

Free and Reduced Lunch Program Participation--Economically disadvantaged families are provided with free and reduced-price lunches through the National School Lunch program, which was established in 1946 as a result of the National School Lunch Act. Creating a threshold, the United States Department of Agriculture publishes annual income guidelines for program eligibility based upon family household income and size compared to federal standards (Florida Department of Education, 2007). Participation in the free and reduced lunch program was determined using data from the current school year.

Socioeconomic Status--For the purpose of this study, socioeconomic status was measured by participation in the free and reduced lunch program.

Methodology

Population

The population of this study consisted of students in six high schools in two central Florida school districts who participated in the AVID program during the 2007-2008 and 2008-2009 school years and a demographically matched set of students from these high schools who did not participate in the AVID program during the same two school years.

Data Collection

A request to conduct research was submitted to the school districts and approval was granted. The Institutional Review Board (IRB) process was completed and the IRB

determined that this study was not human subjects research and therefore the University of Central Florida IRB review and approval was not required (See Appendix A).

The researcher contacted each school principal by phone to schedule a time to meet with the appropriate personnel from each school site to gather student demographic and achievement data. The researcher intended to visit each school personally to obtain the necessary data to conduct the research study. While all principals agreed to have their schools participate in the research study, several principals in one district expressed concern about providing the researcher with access to confidential student information. As a result, the Coordinator of Program Accountability and Evaluation and the Performance Measurement Specialist in that district provided the researcher with all data from the five identified high schools in an Excel spreadsheet. School names were replaced with School A, School B etc. and student names and numbers were replaced with 1, 2, 3 etc. See Appendix B for Excel spreadsheet template.

In addition to gathering student data, the researcher interviewed the AVID coordinator at each school by phone to determine how each of the 11 AVID essentials was implemented at the school site. The interview questions can be found in Appendix C.

Data were collected on students who entered the ninth grade in 2007-2008 and remained continuously enrolled in the same school for tenth grade in the 2008-2009 school year. Student demographic and achievement data for this population was studied.

Students participating in the AVID program were matched with non-AVID participants from the same school for each school site. Students were matched as closely as possible based on ethnicity, gender, economic status, ESE and LEP status, eighth grade FCAT developmental scale scores in mathematics and reading, and eighth grade

FCAT writing scores. A more detailed explanation of the process used to match students is included in Chapter 3. Results of the matching are included in Chapter 4.

Data Analysis

The researcher transferred all collected data from Excel spreadsheets to SPSS (version 16.0). For Research Question 1 (to what extent was a mean difference from eighth to tenth grade FCAT mathematics developmental scale score gains for students based on participation in AVID, and their ethnicity, gender, and economic status), a factorial ANOVA was conducted. The dependent variable was the FCAT mathematics developmental scale score gain. The independent variables were participation in AVID, ethnicity, gender, and economic status.

To answer Research Question 2 (to what extent was a mean difference from eighth to tenth grade FCAT reading developmental scale score gains for students based on participation in AVID, and their ethnicity, gender, and economic status), a factorial ANOVA was conducted. The dependent variable was the FCAT reading developmental scale score gain. The independent variables were participation in AVID, ethnicity, gender, and economic status.

For Research Question 3 (to what extent was there a mean difference in tenth grade FCAT writing scores for students based on participation in AVID, and their ethnicity, gender, and economic status), a third factorial ANOVA was conducted. The dependent variable was the FCAT writing score and the independent variables were participation in AVID, ethnicity, gender, and economic status. Table 1 displays the research questions, the sources of data and statistical analysis used for this study.

Table 1
Research Questions, Data Sources and Statistical Analyses

Research Questions	Data Source	Statistical Analysis
1. To what extent is there a mean difference from eighth to tenth grade FCAT mathematics developmental scale score gains for students based on participation in AVID, and their ethnicity, gender, and economic status?	School Districts, Student Information System	Factorial ANOVA
2. To what extent is there a mean difference from eighth to tenth grade FCAT reading developmental scale score gains for students based on participation in AVID, and their ethnicity, gender, and economic status?	School Districts, Student Information System	Factorial ANOVA
3. To what extent is there a mean difference in tenth grade FCAT writing scores for students based on participation in AVID, and their ethnicity, gender, and economic status?	School Districts, Student Information System	Factorial ANOVA

Delimitations of the Study

1. The study was delimited to select Florida High Schools with certified AVID programs in two school districts.
2. The study was delimited to students who were continuously enrolled in 9th and tenth grade at the same high school during the 2007-2008 and 2008-2009 school years and who were enrolled in the AVID program or were a matched sample of non-AVID students.

Limitations of the Study

1. Economic status was defined by participation in the free and reduced lunch program. Students may have been economically disadvantaged but were not identified because they were not participating in the free and reduced lunch program.
2. Since the Florida Comprehensive Assessment Test (FCAT) was used to determine student performance, it was difficult to generalize the results of this study beyond the state of Florida. Furthermore, the results of this study may generalize only to students and schools who share similar characteristics as those examined in this study.
3. An additional limitation of this study was the use of aggregate data without addressing the nesting of students within schools. The analysis of individual school outcomes would be compromised due to the insufficient sample size that would be created by disaggregating the FCAT results by school.

Significance of the Study

Many studies have been conducted on the AVID program since its inception in 1980 (Guthrie & Guthrie, 2002; Mehan et al., 1994; Rorie, 2007). Most of those studies have been conducted in California and Texas (Oswald, 2001; Swanson, Mehan, & Hubbard, 1993; Watt et al., 2006). This study will add to the growing body of research regarding the relationship that the AVID program has on student achievement specifically as it relates to student performance in mathematics, reading, and writing, on the FCAT. It was also intended that this research would address the relationships between gender, ethnicity, and economic status and student performance in AVID. The results of this research may help school leaders in Florida determine whether or not the AVID program is effective in increasing student performance and if it is a viable option in assisting students in meeting the state's high accountability standards.

Summary

During times when resources for education are scarce, educational leaders must make decisions regarding implementation of programs and practices that will have the greatest impact on student achievement. Leaders must determine what programs should be eliminated and what programs should remain. Advancement Via Individual Determination (AVID) is a program that was created by Mary Catherine Swanson in 1980 and has continued to expand in the 21st century. The program was designed to assist students in the academic middle succeed in a rigorous curriculum and enter four year colleges or universities.

The purpose of this study was to determine if there was a relationship in student achievement in mathematics, reading, and writing as measured by the FCAT for students

in the AVID program and those who were not in the AVID program and if there was an interaction between participation in AVID and demographics of ethnicity, gender, and economic status in 2007-2009.

Organization of the Dissertation

This chapter has provided an introduction to the study and included the statement of the problem, the purpose of the study, and the research questions that guided the study. This chapter also provided an overview of the methodology used in the study as well as the study's delimitations, limitations, and significance.

Chapter 2 contains a review of the literature that is relevant to the research topic. Those topics include: tracking and ability grouping; student achievement and ethnicity; student achievement and gender; student achievement and economic status; the methodologies used in the AVID program; and research on the AVID program specifically. Chapter 3 outlines the methodology and procedures used in collecting and analyzing the data gathered for the study. Chapter 4 presents the results of the data analysis, and Chapter 5 provides a discussion of the findings, implications for practice, and recommendations for future studies.

CHAPTER 2
REVIEW OF THE LITERATURE AND RELATED RESEARCH

Introduction

To assure a comprehensive review of the literature for this investigation, the researcher initially completed an extensive search of the relevant research by accessing databases via the University of Central Florida Libraries and selecting only full text and peer reviewed sources. The following databases were utilized in this process: Educational Resource Information Center (ERIC), Dissertations & Theses: Full Text, OmniFile Full Text, PsycInfo, and Web of Knowledge. Subsequent to this review, consultation with the University of Central Florida librarian was accomplished to ascertain additional keywords in an effort to obtain additional research.

After reviewing the research acquired from the initial search, primary sources were secured to strengthen the researcher's understanding of the relevant topics. This process also resulted in a review of a variety of texts, journal articles, and websites. The review examined the research relevant to the Advancement Via Individual Determination (AVID) program. Since the AVID program advocates for the detracking of students, the review began with a search of the literature on tracking and ability grouping. The review also included research on student achievement and ethnicity, gender, and economic status. Additionally, the review included instructional methodologies used in the AVID program, which consist of writing and reading as a tool of learning, inquiry, and collaboration. Finally, the review concluded with previous research conducted on the AVID program specifically.

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Tracking and Ability Grouping

Tracking and ability grouping was researched in the 1980s and 1990s before accountability was implemented for achievement. Thereafter, research on this topic became less prevalent as detracking became the research focus. As defined by Oakes (1986), "tracking is the practice of dividing students into separate classes for high-, average-, and low-achievers; it lays out different curriculum paths for students headed for college and for those who are bound directly for the workplace" (p. 13). In high schools, students are placed in "tracks" and take courses considered academic, vocational, or general. (Gamoran, 1992; Hallinan, 1994; Oakes, 1986). In addition, schools use ability grouping, "the practice of organizing classrooms in graded schools to combine children who are similar in ability" (Kulik & Kulik, 1982, p. 415) to further divide academic subjects into levels (Oakes, 1987).

Advocates for tracking have stated that if students are assigned to classes or groups with similar academic abilities, their teachers can provide them with instruction that is geared toward their academic needs and ability levels and thus facilitate learning (Hallinan, 1994; Oakes, 1992; Rubin & Noguera, 2004; Slavin, 1990). Kulik and Kulik (1982) reported that students of high ability benefit from being placed in special programs for gifted and talented and that studies have shown that attitudes toward the subject matter were more positive for students in grouped classes than those in ungrouped classes. Kerckhoff (1986) reported that the traditional view of ability grouping is that it has a positive academic effect for all students. High ability students can move ahead at a faster pace and teachers can alter the lesson pace and curriculum for low ability students.

Critics of tracking stated that students in lower tracks are not provided with the same curriculum opportunities as those in higher tracks. The topics and skills are less demanding and sometimes taught by less experienced and competent teachers. Because students in the lower tracks seem to fall farther behind as a result of differences in curriculum coverage, their tracks tend to be fixed starting as early as elementary school (Hallinan, 1996; Oakes, 1992; Slavin, 1990; Smith-Maddox & Wheelcock, 1995).

Kulik and Kulik (1982) conducted a meta-analysis of findings from 52 studies of ability grouping in secondary classrooms. These studies included findings on effects of grouping in student achievement, self-concept, attitude toward subject matter, and attitude toward school. The authors reported that in 36 of the 51 studies, students from grouped classes performed better than students from ungrouped classes. In 14 studies, it was the opposite, and in one study, there was no difference. Overall, the effect of ability grouping on student achievement was small except for the 14 studies on talented and gifted students. Those studies showed that students performed better in honors courses than in mixed-ability classes (Kulik & Kulik).

Kulik and Kulik (1982) reported that 15 studies revealed results on self-concept. In seven studies, it was reported that self-concept was higher for students in grouped classrooms; in six studies, opposite findings were reported. In two of the studies, no difference was shown in self-concept between the two groups.

In attitudes toward subject matter, eight studies revealed results for students in grouped and ungrouped classes. The authors indicated that the grouping in each of these studies was used for specific subjects such as mathematics and English. In seven of the eight studies, more positive student attitudes toward the subject matter were found for

students in the grouped classes (Kulik & Kulik, 1982). Additionally, the authors reported on the 11 studies that showed the results on attitudes toward school. Students in grouped classes had more favorable attitudes toward school in eight of the studies. In three of the studies, students in ungrouped classes had a more favorable attitude (Kulik & Kulik, 1982).

In short, Kulik and Kulik (1982) reported that the effects of grouping were small for student achievement except for students in honors programs. Furthermore, student self-concept, student attitudes toward subject matter, and student attitudes toward school were positive for students in grouped classes.

Another extensive study was conducted by Slavin (1990). In his "best-evidence synthesis," he reviewed the effects of ability grouping on student achievement in 29 studies (six random control trials, nine quasi-experiments, and 14 correlational). In his review of the literature, Slavin (1990) concluded "the arguments for and against ability grouping have been essentially similar for 70 years" (p. 472). His summary included a list of the advantages and disadvantages of ability grouping found in the literature.

Advantages of ability grouping:

1. It permits pupils to make progress commensurate with their abilities.
2. It makes possible an adaption of the technique of instruction to the needs of the group.
3. It reduces failures.
4. It helps to maintain interest and incentive, because bright students are not bored by the participation of the dull.
5. Slower pupils participate more when not eclipsed by those much brighter.
6. It makes teaching easier.
7. It makes possible individual instruction to small slow groups.

Disadvantages of ability grouping:

1. Slow pupils need the presence of the able students to stimulate them and encourage them.
2. A stigma is attached to low sections, operating to discourage the pupils in these sections.

3. Teachers are unable, or do not have time, to differentiate the work for different level of ability.
4. Teachers object to the slower groups (Slavin, 1990, p. 473).

Slavin (1990) added two additional arguments for disadvantages of ability grouping from later reviews. He summarized those arguments as, "ability grouping discriminates against minority and lower-class students. . . students in the low tracks receive a lower pace and lower quality of instruction than do students in the higher tracks" (p. 473). Additionally, "ability grouping is perceived to perpetuate social class and racial inequalities because lower class and minority students are disproportionally represented in the lower tracks" (p. 473).

Slavin (1990), in his review of 29 studies, concluded "the effects of ability grouping on student achievement are essentially zero" (p. 484). Although he acknowledged the limitations to the scope of his review, he stated his conclusions with confidence. He believed that if ability grouping had a positive effect on student achievement, the studies he reviewed would have shown it.

Slavin (1990) was criticized for his conclusions regarding ability grouping (Hallinan, 1990). Hallinan (1990) cautioned educators against making practice and policy decisions based on Slavin's conclusions. Hallinan (1990) explained that the studies Slavin analyzed compared mean achievement scores of ability grouped and non-ability grouped classes. "Since means are averages, they reveal nothing about the distribution of scores in the two kinds of classes. Ability grouping may increase the spread of test scores while leaving the mean unchanged . . . studies comparing only mean would show no direct effect of grouping on achievement" (Hallinan, 1990, p. 501).

Hallinan (1990) also expressed the belief that the studies Slavin (1990) reviewed did not consider all aspects of instructional design and therefore resulted in Slavin's flawed conclusions regarding ability grouping across high and low ability groups. Hallinan also stated that most of the studies Slavin (1990) reviewed were conducted decades earlier when the intent and focus of ability grouping may have been different from current practices.

Gamoran (1992) concurred with Hallinan (1990) when referring to Slavin's study. Gamoran (1992) stated, "grouping and tracking rarely add to overall achievement in school, but they often contribute to inequality. . . high-track students are gaining and low-track students are falling farther behind" (p. 13). Gamoran stated that a number of case studies have suggested " the quality of instruction and the climate for learning favors high-level groups and honors classes over low groups and remedial classes" (p. 13).

Gamoran (1992) advocated for the reduction in the use of tracking and grouping. Additionally, he suggested that where grouping is retained, improvements must be implemented in how it is used. More specifically, he addressed the rigidity of tracking systems, indicating that the more rigid a tracking system is, "the more research studies have found no benefits to overall school achievement and serious detriments to equity" (p. 15). He provided suggestions for improving the use of ability grouping and advocated for more flexibility. He stated that schools should not lock students (or teachers) into tracked assignments and that students who were ready to move to higher tracks should be able to do so. They should not be penalized for gaps in the curriculum they may have experienced but should be given opportunities to make up missed material.

Additionally, Gamoran stressed that instruction must be improved in the lower tracks. He acknowledged that this might be difficult given that teachers assigned to teach in the lower tracks have low academic expectations for those students and students assigned to lower tracks avoid participating in rigorous curriculum.

Hallinan (1994) relayed what the research stated about how students are assigned to tracks. She stated that academic and non-academic factors influence how students are typically assigned to tracks. According to Hallinan (1994), the academic factors include, grades, standardized test scores, counselor and teacher recommendations, prior track placement and course prerequisites. The non-academic factors include student work demands, conflicts with courses selections, student participation in extra curricular activities, and availability of teachers and curriculum resources. Additionally, she reported that research shows that schools differ in the criteria that are used to assign students to tracks and that tracks are less permanent than is believed. Furthermore, she noted, lower tracks contain a greater proportion of minority and low-income students and finally, there seems to be a social status assigned to tracks with higher tracks having a higher social status (Hallinan, 1994).

Hallinan (1994) also stated that students in high-ability tracks learn more and have curriculum that is more interesting and engaging. She pointed out that fewer learning opportunities are presented to students of lower ability in the lower tracks and "since low ability is related to race, ethnicity, and socioeconomic status, tracking discriminates against students in these demographic categories" (p. 80). Hallinan (1994) concluded that the research seems to advocate against tracking as an organizational and

pedagogical practice but she believes that schools should look at how tracking can be improved not necessarily eliminated.

Detracking

A growing body of research proposes detracking as a way to close the achievement gap (Burris & Garrity, 2008; Burris & Welner, 2005; Burris, Wiley, Welner, & Murphy, 2008; Goodlad & Oakes, 1988; Oakes & Lipton, 1992; Slavin, 1995). The common theme found in the detracking literature is to ensure that all students are provided with equal access to knowledge that is typically found in "high track" classrooms (Burris & Welner; Burris et al., 2008; Goodlad & Oakes).

Oakes and Lipton (1992) acknowledged the difficulties that arise when trying to implement a detracking project. However, they have found commonalities in the cultures of schools that have successfully implemented a detracking philosophy. They stated that the cultures of detracked schools have the following characteristics: Powerful norms regarding tracking are confronted; change in tracking is part of a comprehensive reform agenda; the environment is one that nurtures experimentation and inquiry; teachers' roles and responsibilities are examined and altered; and leaders are committed and persistent in the reform effort (Oakes & Lipton).

Brewer, Rees, and Argys (1995) expressed concerns regarding the achievement outcomes of detracking. They presented findings that indicated students in low track mathematics classes perform worse academically and students in high track mathematics classes perform better academically than if both sets of students were in untracked classes. They stated that this makes the policy less straightforward. They argued that detracking would "create winners *and* losers" (p. 214).

Several authors commented on the conclusions of Brewer et al. (1995) (Gallagher, 1995; Jaeger & Hattie, 1995; Slavin, 1995). One criticism was related to differences in achievement may be the result of differences in curriculum coverage and not necessarily the result of ability grouping (Jaeger & Hattie). Additionally, Jaeger and Hattie asserted that since the effects of ability grouping are small, more emphasis should be placed on factors that improve instruction. This might include additional training for teachers and enhanced teacher selection processes.

Gallagher (1995) argued that the article written by Brewer et al. (1995) "raises important educational and policy questions" (p.216). He stated that the real question is, "Should students, regardless of their past performance or current aptitude or vocational interests, be receiving identical curricular experiences in secondary education" (p. 217)? Gallagher advocated for a differentiated curriculum based on the needs of the students. He argued that students preparing for careers in carpentry or computer maintenance should receive instruction in applied mathematics courses while students preparing to be a "theoretical mathematician or an electrical engineer" should receive a more advanced curriculum in mathematics. Furthermore, Gallagher contended that there needed to be more conversation about the usefulness of the math curriculum. He believed that such conversations were avoided by individuals who did not want to become involved in arguments related to equity and quality.

Brewer et al. (1995) was also criticized by Slavin (1995). He questioned the methodology used in the study and the conclusions drawn regarding the detrimental effects that detracking would have on high achievers. Slavin (1995) argued that there is no justification for the use of ability grouping. He stated, "ability grouping by its nature

works against democratic and egalitarian norms, often creates racial or ethnic divisions, risks making terrible and long-lasting mistakes, and condemns many children to low-quality instruction and low-quality futures" (p. 221).

Brewer, Rees, and Argys (1996) responded to these criticisms by emphasizing that they were neither for nor against detracking but that the results of their study indicated that the answer is not that simple. Many factors must be taken into consideration when policies are created to improve schools. They agreed with Slavin's statement "Let's all work toward schools that can do a better job with *all* of our children" (Slavin, 1995, p. 221; Brewer et al., 1996, p. 444).

Burris and Garrity (2008) provided a practical guide for educators and policy makers to follow when implementing a change toward detracking and improving education for all students. They outlined the restructuring that took place in Rockville Centre, New York that began in 1989 with the elimination of South Side Middle School's tracking system. At that time, the new Superintendent of Schools, William H. Johnson, concluded that tracking was to blame for the wide achievement gap (Burris & Garrity). The tracking system was very rigid with high representation of minority and economically disadvantaged students in the lowest tracks. The achievement gap was widening for students in the lowest tracks as a result of an emphasis on discipline rather than an emphasis on academics.

Burris and Garrity (2008) reported that Superintendent Johnson eliminated the low track classes in the middle school and in 1993 he set a goal that "by the year 2000, 75 percent of all South Side High School students would earn a Regents diploma" (p. 7). They explained that the restructuring actually began in the elementary school with the

transformation of the school's gifted program. The gifted and talented program was phased out over a four-year period and replaced with a district wide enrichment program called STELLAR, which stands for Success in Technology, Enrichment, Library, Literacy, and Research (Burris & Garrity).

Burris and Garrity (2008) outlined the steps taken to detrack the middle school mathematics classes and how the high school had eliminated the low-track, non-Regents classes in mathematics followed by English, social studies and science. The authors reported that Superintendent Johnson exceeded his goal and in 2000, South Side High School Regents diploma rate was 84% and by the year 2005, it reached 97%. The authors also pointed out that minority students receiving a Regents diploma went from 32% in the year 2000 to 92% in 2005.

Burris, Wiley, Welner, and Murphy (2008) published a longitudinal study on South Side High School (the above mentioned school). The study used a quasi-experimental design examining demographic and achievement data for six cohorts of students. The first three cohorts were before the detracking efforts, students entering high school in 1995, 1996, and 1997. The final three cohorts were after the detracking efforts and included years 1998, 1999, and 2001. They used achievement data from the scores on the mathematics portion of the PSAT, the verbal portion of the PSAT, the earning of the New York State Regents diploma, and the earning of the International Baccalaureate (IB) diploma. The authors used binary logistic regression analysis and found that there was a

> statistically significant post-reform increase in the probability of students earning these standards-based diplomas. Being a member of a detracked cohort was associated with an increase of roughly 70% in the odds of IB diploma attainment and a much greater increase in the odds of Regents diploma attainment – ranging from a three-fold increase for White or Asian students, to a five-fold increase for African American or Latino students

> who were eligible to receive free or reduced-price lunch, to a 26-fold increase for African American or Latino students not eligible for free or reduced-price lunch. Further, even as the enrollment in International Baccalaureate classes increased, average scores remained high (p. 572).

The authors concluded that detracking could be an effective strategy to help all students reach high academic standards. They emphasized the importance of providing sufficient resources to the detracking effort and having the belief that all students can learn given the opportunity to participate in an enriching curriculum. Burris and Welner (2005) concluded, "The results of detracking in Rockville Centre are clear and compelling. . . The Rockville Centre reform confirms common sense: closing the "curriculum gap" is an effective way to close the "achievement gap" (p. 598).

Student Perspectives on Tracking

There appears to have been limited research conducted on tracking from the perspective of students. However, one study conducted by Yonezawa and Jones (2006) utilized student focus groups to determine students' perspectives on tracking. Data was collected from more than 500 students from 12 high schools in three urban districts. Yonezawa and Jones reported that the population for the study contained students in grades nine through twelve with demographics of "48% male and 52% female and 24% White, 36% African American, 29% Latino, 11% Asian, and 1% American Indian/Alaskan Native" (p. 16). Students with grade point averages of 1.99 or below made up 13% of the population, students with grade point averages between 2.00-2.99 made up 40% of the population, and students with 3.00 or above made up the remaining 47% of the population (Yonezawa & Jones).

Yonezawa and Jones (2006) stated that the focus groups revealed what students said about tracking. They reported the following generalizations: (1) Students reported that placement and tracking practices seemed unfair and that most students were not sure how those placements occurred; (2) Students did not think it was fair to use test scores to determine placement. The students pointed out that some students had "blown off the test" and therefore were placed in the wrong classes. Others stated that standardized test scores do not reveal student motivation or ability; (3) Students reported that they believed students in the lower tracks get less competent teachers. They also expressed that teachers have lower expectations for students in lower tracks and that teachers would prefer to teach AP students; (4) Students reported that it was easier to move down a track than up; and (5) Some students supported tracking and believed it was their right to have access to rigorous curriculum taught by the best teachers (Yonezawa & Jones).

Yonezawa and Jones (2006) also reported on what students said about detracking. They stated that students knew it would take more than just eliminating the low tracks; it would take teachers believing in all students, learning new ways of teaching, and engaging students in more rigorous curriculum. Yonezawa and Jones suggested that adults could learn a great deal about the inequitable practices found in tracked classrooms and deficiencies in the current educational system by listening to the perceptions of students.

Student Achievement and Ethnicity

"Understanding race, ethnic, and immigrant variation in educational achievement and attainment is more important than ever as the U.S. population becomes increasingly diverse" (Kao & Thompson, 2003, p. 418). According to Bali and Alvarez (2004), "one

of the most pressing concerns in American public education today is the so-called race gap in student achievement test scores" (p. 393). According to Kao and Thompson, achievement gaps showed Asian students outperforming White students and White students outperforming Black students and Hispanic students in grades and on standardized tests. Much research has been conducted to determine when and why these gaps occur.

According to Kao and Thompson (2003), the most contemporary theories about why differences in achievement exist among ethnic groups fall into two general categories. The first is cultural orientation regarding whether or not academic achievement is promoted or discouraged and the second is the group's structural position. Structural position is an extension of the concept of cultural orientation. To be more specific, it takes into account factors such as parental economic status and value placed on attaining a quality education as well as student interactions within multiple environments including parent, peer, and school relationships. Additionally, according to Kao and Thompson, structural position is also impacted by: (a) time of arrival of the ethnic group to the country, (b) the existing skill set the ethnic group brings and provides to the community, (c) the needs of the local economy, and (d) if and how the group can fill the desired economic niches.

Support for the cultural orientation of ethnic groups can be found early on in research conducted by Rosen (1959). He studied the orientation toward achievement (in the form of social mobility) on members of six racial and ethnic groups with similar periods of residence in America and similar economic circumstances: French-Canadians, Southern Italians, Greeks, East European Jews, Negros, and native-born White

Protestants. He found that these groups differed in their emphasis of achievement with Greeks, Jews, and White Protestants having higher achievement motivation and Italians, French-Canadians, and Blacks having lower achievement motivations.

Moreover, other researchers have shown that academic motivation and achievement is influenced by ethic and racial group identity (Altschul, Oyserman, & Bybee, 2006; Ogbu, 2003; Wakefield, & Hudley, 2007). Wakefield and Hudley defined racial and ethnic identity as "the sense of belonging that an adolescent feels toward a racial or ethnic group as well as the significance and qualitative meaning that the adolescent assigns to that group membership" (p. 148). According to Wakefield and Hudley, a strong identification with one's ethnic group can facilitate or discourage achievement motivation.

One theory often cited in the literature explaining the Black-White achievement gap is that of Black students taking an oppositional stance toward academic achievement for fear of being accused of acting White (Bergin & Cooks, 2002; Fordham, 2008; Fordham & Ogbu, 1986; Kao & Thompson, 2003; Ogbu, 1987, 1990, 2004; Tyson & Darity, 2005; Wakfield & Hudley, 2007). Ogbu (2004) argued that Black students developed their sense of oppositional collective identity during slavery and stated that "the racial identity formed during slavery has continued to influence Black perceptions of and responses to White treatment to this day" (p. 8). Ogbu (2004) explained that Black students did not embrace the cultural norms for education and social status of White students after emancipation. He stated that Black students knew they would have to talk and act like White people if they wanted to move up socially, get an education, and be accepted by the White students.

Ogbu (2004) stated that he had found few Black students who rejected good grades because it was "White." He argued, what Black students were really rejecting were White attitudes and behaviors that lead to academic success. The study conducted by Ogbu (2003) in Shaker Heights showed that Black students rejected behaviors and attitudes such as speaking standard English, taking honors and AP classes, and socializing with White students. Ogbu (2003) concluded that family upbringing and support minimized negative peer pressure that kept students from participating in behaviors that enhanced their academic performance.

LeCroy and Krysik (2008) conducted a study to determine what factors predicted academic achievement and school attachment among Hispanic students and if associations between those factors were similar for Hispanic and White students. Their sample consisted of 170 seventh and eighth grade students (46 White and 124 Hispanic) from one middle school in a southwestern city. Data were gathered from questionnaires that were administered to the students during one 50-minute class period. Student responses to questions provided the researchers with data on socioeconomic status, parental support, linguistic acculturation, school attachment, school involvement, expectancy for education, peer characteristics, and grade point average.

LeCroy and Krysik (2008) used a series of ordinary least square regressions and found that for Hispanic students, parental support, peer influences, and school attachment were strong predictors of achievement. They stated that supportive parent relationships, associations with pro-academic peers, and a greater attachment to school lead to higher achievement. When analyzing differences by ethnicity, they found that differences did exist between White and Hispanic students on some of the variables. White students had

higher grade point averages, greater attachment to school, higher economic status, greater affiliation with pro academic peers, and greater linguistic acculturation but that the associations between the variables used to predict academic achievement and school attachment did not differ for Hispanic and White students (LeCroy & Krysik).

Whether comparing Black students to White students or Hispanic students to White students, one common premise apparent in the studies by Ogbu (2003) and LeCroy and Krysik (2008) was that a relationship existed between family support and student achievement. Greater parental support tended to lead to higher academic achievement for all ethnicities.

Wing (2007) reported that Asian students demonstrated high academic performance but cautioned that Asian students having academic difficulty in school tend to be overlooked due to the racial stereotype that Asian students are high achievers. He stated that this was "tied to the "Model Minority Myth," which said that Asians comprise the racial minority group that has "made it" in America through hard work and education, and therefore serve as a model for other racial minorities to follow" (p. 456). Wing conducted a study at Berkeley High School in California. He studied data on the entire graduating class of 2000 along with a qualitative case study focusing on six Asian students. Although he acknowledged that many Asian students at Berkeley High were academically successful, he noted that others were not and that some were even in danger of never completing high school.

Wing (2007) interviewed three male and three female Asian students and found that all of them experienced some form of academic difficulty but argued that these difficulties went unnoticed by teachers due to the stereotype that Asian students are smart

and school is easy for them. Wing advocated for dispelling myths and stereotypes in our public schools particularly as it related to the educational needs of Asian and Pacific Islander Americans. He argued that once educators understand the needs of Asian students, they would be able to put programs and services in place to address those needs.

According to Wadsworth and Remaley (2007), "Americans of all backgrounds believe education is the key to the good life" (p. 23). Kao and Thompson (2003) reported that by the year 2025, 46% of all students ages 15 through 19 will be from minority groups. Educators must work hard to eliminate the race gaps in student achievement so that all children will have an equal opportunity for successful futures.

Student Achievement and Gender

Research shows that there are gender differences in educational achievement particularly in the areas of reading and mathematics with females performing better than males in reading and males performing better than females in mathematics, although the achievement gap for mathematics appears to be decreasing (Geist & King, 2008; Husain & Millimet, 2009; Ma, 2008; Marks, 2008).

Lietz (2006) conducted a meta-analysis of 139 studies conducted between 1970 and 2002 examining gender differences in reading achievement at the secondary school level. Lietz included a description of the assessment programs used in most of the studies, which included the Reading Comprehension Study, Reading Literacy Study, Programme for International Student Assessment (PISA), The National Assessment of Educational Progress (NAEP), and several studies conducted in Australia. He concluded that a gender gap existed in favor of females and pointed out that this difference was greatest in the NAEP and PISA assessment studies.

Chiu and McBride-Chang (2006) conducted a study of 199,097 fifteen-year-olds in reading comprehension performance across 43 countries using the Organization for Economic Cooperation and Development's Program for International Student Assessment (OECD-PISA) database. The authors "analyzed the data using multilevel regressions of Rasch-estimated test scores to test the associations of gender and context on reading achievement among adolescents" (p. 331). Their findings were consistent with those of Lietz (2006). Chiu and McBride-Chang concluded that gender differences in reading exist around the world and that females outperformed males in reading in every country.

When studying gender differences in mathematics achievement of students ages 14-16 across 69 nations, Else-Quest, Hyde, and Linn (2010) conducted a meta-analysis of the 2003 Trends in International Mathematics and Science Study (TIMSS) and the PISA. They concluded that on average, there is very little difference between males and females in regards to mathematics achievement even though males tend to have more positive attitudes toward mathematics than females. They pointed out that a gender gap in mathematics achievement still exists in some nations; however, it has closed in the United States.

Gibb, Fergusson, and Horwood (2008) conducted research on gender differences in educational achievement on a cohort of 1265 individuals in New Zealand from birth to age 25. They reported that from ages 8 to 25 males tended to have lower scores on standardized tests than females even though there was no significant difference between genders on IQ measures. Additionally, the authors noted that teachers reported males, regardless of age, were more likely to behave poorly in the classroom. When controlling

for classroom behavior, the authors reported that gender differences in achievement were no longer statistically significant. As a result of their study, Gibb et al. suggested, "one of the ways in which male educational achievement could be raised is by improving classroom behaviour" (p. 75).

In the 1980s, educators were reevaluating practices that appeared to be contributing to the underachievement of females (Wiens, 2005). It appears that the pendulum has swung in the opposite direction with increasing emphasis being placed on the underachievement of males (Clark, Lee, Goodman, & Yacco, 2008; Jones & Myhill, 2004). Wiens (2005) addressed this concern for balance, indicating that teachers must be as aware of the needs of their male students as they were in years past of female student needs. She advocated against being overly attentive to either males' or females' needs in classrooms if such attention would disadvantage either group.

Student Achievement and Socioeconomic Status

According to Kao and Thompson (2003), "Parental education and family income is probably the best predictor of eventual academic outcomes among youth" (p. 431). They stated "these differences are substantial across race, ethnic, and immigrant groups, and help to explain a substantial proportion (although not all) of the variation in educational outcomes of youth" (p. 431).

Many studies have been conducted that showed the relationship between low academic performance on state and national tests and the economically deprived (Caldas & Bankston III, 1997; Frederickson & Petrides, 2008; Sackett, Kuncel, Arneson, Cooper & Waters, 2009; Strenze, 2007). A study conducted by Caldas and Bankston III of over 42,000 tenth grade students in public high schools in Louisiana revealed that "individual

family poverty status, as indicated by participation in the federal free/reduced-price lunch program, does have a small, independent negative effect on academic achievement" (p. 274) as measured by the Louisiana Graduation Exit Examination. The authors also noted that academic achievement of students who are economically disadvantaged suffers regardless of race. However, they indicated that there was a "strong correlation with being poor and being African American" (p. 273).

Approximately four years later, Okpala, Okpala, and Smith (2001) appeared to come to the same conclusion as Caldas and Bankston III (1997). They predicted, "the SES of students in a given school, measured by the percentages of students that participate in free/reduced-price lunch programs will affect student achievement negatively" (p. 111). As part of their study, Okpala et al. investigated the relationship between mathematics achievement and economic status of fourth-grade students in one low-income North Carolina county.

Okpala et al. (2001) reported that the school system used in the study had a diverse student population with 47.6% White, 44.6% Black, 4.5% Hispanic, 1.7% Asian, and 1.6% Native American. They noted that low-income schools had more Black students than high-income schools and that the percentage of students mastering mathematics increased as the income status of the school increased for both Black and White students.

Okpala et al. (2001) reported that the results of regression analysis and Pearson product-moment correlation tests confirmed that the "percentage of students in free and reduced-price lunch programs was correlated negatively with mathematics scores, as predicted" (p. 114).

Consistent with other researchers findings that low economic status correlated with low academic achievement, Tate (1997) reported findings on college entrance examinations that in 1990, the mean SAT score for mathematics for students with a family income of less than $10,000 was 419, students with a family income between $30,000 and $40,000 had a mean score of 469, and students with a family income of $70,000 or more had a mean score of 527. Furthermore, he reported that a similar trend existed for ACT scores.

Although many studies consistently report that low economic status is correlated with low academic achievement, there are studies that show economically disadvantaged students having high academic achievement (Caldwell & Ginther, 1996; Milne & Plourde, 2006). Milne and Plourde conducted a study to examine what the factors were that contributed to academic success for students from economically disadvantaged homes. She concluded from her qualitative research that common themes existed in the homes of high achieving, economically disadvantaged students: Educational materials and a specific time to complete homework were established in each home; positive relationships which included parents spending quality time with their children; the mother's education; and a clear expression that education was important and completing schoolwork and other educational activities was non-negotiable. Milne and Plourde cautioned that just because a child comes from an economically disadvantaged home, it does not mean that they are destined to fail.

AVID Instructional Methodologies

The methodologies used in the AVID program are designed to assist students in meeting the high standards of a rigorous college curriculum. They include: (1) writing as

a tool of learning, (2) inquiry method, (3) collaborative, subject-specific learning groups, and (4) reading as a tool of learning. These methodologies are labeled WICR (writing, inquiry, collaborative, reading) strategies (Arellanes et al., 2007).

Writing as a Tool of Learning

Writing to learn is an effective tool that requires students to become active learners and transforms classrooms from teacher centered to student centered (Gammill, 2006; Hennessy & Evans, 2005). Arellanes et al. (2007) noted that writing helps students think critically. Furthermore they stated, "Writing contributes to self-knowledge. Writing helps clarify and order experience. Writing helps students to be better readers. Writing enables students to "do better" in school. Writing is basic to thinking, learning, and growth" (p.35).

Studies at all educational levels and in a variety of disciplines have been conducted regarding writing as a tool of learning (Balgopal & Wallace, 2009; Drabick, Weisberg, Paul, & Bubier, 2007; Kieft, Rijlaarsdam, & van den Bergh, 2006; Moore, 1994). Reviewing studies at the secondary level as well as the college level is relevant as AVID places a great deal of emphasis on this instructional methodology.

Writing is a tool that can be used to help students comprehend text in content area classes (Knipper & Duggan, 2006). Knipper and Duggan described the purpose of writing to learn as a vehicle for further learning. They stated, "writing to learn is an opportunity for students to recall, clarify, and question what they know about a subject and what they still wonder about with regard to that subject matter" (p. 462).

Summary Writing and Note Taking

Radmacher and Latosi-Swain (1995) stated that one effective writing strategy is summary writing. According to Radmacher and Latosi-Swain, summary writing enhances learning by requiring students to think critically about the text and including only the most important aspects of it in their summary. The authors argued that summarizing text increases comprehension at a higher level compared to comprehension gained by just reading it.

When summarizing information and taking notes, students in AVID utilize an adaptation of the Cornell note taking system (Arellanes et al., 2007). Students separate their paper into two parts, a large section of the paper on the right and a narrow margin on the left. On the right side of the paper, students take detailed notes from texts or class lectures. On the left side of the paper, students develop questions from the notes taken. AVID students are required to keep all notes in a large binder and bring that binder to each academic class. Cornell notes are taken in each class and checked by the AVID teacher during the AVID elective class.

Faber, Morris, and Lieberman (2000) conducted a study on the effect of note taking on ninth grade students' comprehension. The study included 115 students enrolled in a World Cultures course from a suburban junior high school. Sixty-one students received instruction and practice using the Cornell note taking method for nine weeks and the remaining 54 students did not. They found that the group of students who received instruction and practice using the Cornell note taking method scored significantly higher on comprehension tests than the group who did not receive training.

Faber et al. (2000) concluded since note taking enhanced student performance, they hoped that these results would encourage teachers to include instruction in note taking as part of their course. They also concluded that regardless of ability level, students showed higher comprehension after instruction and practice with note taking. They stated, "this has implications for the classroom teacher, in that instruction can be given to a heterogeneous group with confidence that both extreme ability groups will benefit" (p. 268).

Marzano, Pickering, and Pollock (2001) listed summarizing and note taking as one of nine researched based strategies that increase student achievement. They acknowledged that summarizing and note taking are sometimes thought of as study skills but advocated that they are two of the most important skills for students to master. They stated that summarizing and note taking "provide students with tools for identifying and understanding the most important aspects of what they are learning" (p. 48).

Learning Logs and Journals

The AVID program also utilizes learning logs or journals to assist students in synthesizing what they learned in their classes for the day. Students typically write about what was discussed in class, what they learned, and how that learning connected to previous ideas or lessons. Students share their learning logs in collaborative groups (Arellanes et al., 2007).

Hurst (2005) conducted two studies that showed combining written learning logs with the oral sharing of them helped students learn from the text and from one another. Students used learning logs to write down topics from the text that interested them and to comment on those topics. One study was conducted in middle and high school

classrooms. She surveyed 547 students in grades 7-12 and found that 72% of the middle and high school students reported that reading for interest and completing the learning log helped them understand and remember the text better however, only 43% of the students reported that talking about it helped them remember the text. She also reported that 65% of the middle and high school students "gained new perspectives from the discussions of the text" (p. 45).

Hurst (2005) also surveyed 123 college students to find out if they thought that using learning logs in this manner along with sharing their logs with the class was an effective strategy in helping them learn. She stated that 92% of the students reported that reading for interest helped them remember the text better and 90% reported that talking about it helped them to remember the text better.

One study conducted by Drabick et al. (2007) suggested that short writing assignments improved factual and conceptual learning. The researchers randomly assigned 978 introductory psychology college students to 32 different class sections. Sixteen sections were assigned to the writing condition and sixteen to the thinking condition. Drabick et al. reported, that all students were given the same topics for discussion with some writing about it and others thinking about it for five minutes. The students in all sections then took about ten minutes to further discuss the topic.

For the students assigned to the writing condition, the researchers used the minute-paper technique, which allowed students to write for several minutes in response to specific questions. The students in each section took multiple-choice exams, which included questions that were fact-based and questions that were conceptual in nature. The researchers used the percentage correct as the dependent variable. They reported,

"students in the writing condition performed better on factual and conceptual questions than students in the thinking condition even after accounting for class attendance, semester GPA, and SAT scores" (p.174). The authors concluded, "just 5 min of writing on a topic per week (45 min per semester) produced significantly higher scores on test items than did the same amount of time spent thinking" (p. 174).

Drabick et al. (2007) concluded that their research showed that a technique such as the minute paper which is simple to administer, does not require much preparation time, does not have to be graded, and can be used by most instructors will result in increased student performance. Finally, they surmised, "our study indicates that brief, in-class, ungraded free writing improves integration and application of course material" (p.175).

Carney, Fry, Gabriele, and Ballard (2008) conducted a study with college students to examine which of three assessment methods, Monte Carlo Quizzes (MCQ); learning logs (LL); or non-random quizzes (NR), motivated students to complete reading assignments and assisted them in class preparedness. The MCQ method was used with 23 students in one counseling class and one child and adolescent development class. The LL method was used with 32 students in one educational psychology class and one adolescent development class, and the NR method was used with 31 students in one teaching methods class and one child and adolescent development class. Students in all courses anonymously completed a questionnaire at the end of the semester to gather data on student perceptions and reading behavior.

Carney et al. (2008) reported that the results of the questionnaire showed that the learning log method had the most favorable responses. Students using this method

reported that they completed reading assignments, contributed in class discussions confidently, and would recommend the learning log assessment method to others.

Cognitive-Affective-Behavior Writing to Learn Model

Balgopal and Wallace (2009) conducted a study using 22 undergraduate elementary education majors in a required Biology course to determine whether writing increased ecological literacy. They predicted that guided writing activities using the Cognitive-Affective-Behavior Writing to Learn (CAB-WTL) model would increase ecological literacy. The CAB-WTL model incorporates the cognitive, affective, and behavioral domains of learning and encourages instructors to incorporate guided writing activities that include all three domains. The authors believed that implementing this model in the classroom would help science instructors foster authentic learning.

Balgopal and Wallace (2009) used a mixed-methods approach and after analyzing three concept maps, three two-page in-class essays, and a brief short-answer assessment, they found that "with guided writing activities based on the CAB-WTL model, most students obtained a higher degree of ecological literacy. Of the 22 students, 14 (64%) improved in their literacy level" (p. 22).

Inquiry Method

Inquiry is the instructional method used in AVID collaborative learning groups. This method "teaches students to think for themselves instead of chasing the right answer" (Arellanes et al., 2007, p.38). The content of inquiry lessons come from learning log entries or notes taken in academic classes. Students are taught how to generate effective critical thinking questions and use this strategy to gain knowledge. Arellanes et

al. stressed the importance of the inquiry method. They stated, “Skillful questioning by teachers and tutors empowers students to have mastery of their own learning. The converse—giving answers—breeds dependence on the teacher or tutor and is, therefore, detrimental to the students” (p. 39).

The use of inquiry to enhance learning can be traced back to the philosopher Socrates who used a series of thought provoking questions with his students in hopes that his students would reach understanding and arrive at the truth (Ball & Brewer, 2000). Socratic seminars are routinely used in AVID as a strategy to provoke student thought and dialogue. As stated by Ball and Brewer, “Socratic Seminars return ownership for learning to students as they explore a reading, back up their opinions with textual evidence, challenge each other’s views, and most importantly, find, articulate, and develop their ‘voice’” (p. 3).

While inquiry has long been used in science classrooms, researchers are showing how inquiry and questioning can be used in other disciplines to promote student learning (King, 1995; Spronken-Smith, Bullard, Ray, Roberts, & Keiffer; Stein, Engle, Smith, & Hughes, 2008; White-Clark, DiCarlo, & Gilchriest, 2008). Wilke and Straits (2005) stated, “Inquiry learning is student-based exploration of an authentic problem using the processes and tools of the discipline” (p. 534).

A review of the literature conducted by Pedrosa de Jesus, Almeida, and Watts (2004) identified four central reasons to require students to use questioning to promote learning. They concluded that asking questions creates a culture of inquiry, heightens conceptual understanding, influences classroom interactions, and promotes autonomous inquiry-based learning.

Lord and Orkwiszewsi (2006) conducted a study that compared introductory biology students taught lab by two different instructional methods. One through step-by-step directions and the other through inquiry questions. The participants included 100 college students enrolled in non-majors introductory biology classes. All students attended the same lecture each week but were scheduled into one of four laboratory sections. Two of the lab sections were labeled the control group and followed the step-by-step directions printed in the laboratory manual. The other two sections were the experimental group and followed inquiry-based activities prepared by their instructors.

Each group followed the same format each week. However, during the first five minutes of each class, students completed a 10-question quiz to evaluate what was learned in the previous week. The researchers reported that the students in the experimental group (those using the inquiry approach) had a higher success rate on the weekly quizzes then the control group. They also felt that it was important to note that the written appraisals taken at the conclusion of the course showed that 78% of the comments from the students in the experimental group were positive.

Similar outcomes were found in an earlier study conducted by King (1990). King (1990) examined the value of higher-order questioning to increase student learning which included 26 students in an education methods course from a small university in California. The students were divided into two classes of 13 students each. One class was assigned the questioning treatment and the other class was assigned the discussion treatment. Students were randomly assigned to small learning groups in each class.

The students in the questioning treatment were trained to generate questions that would elicit explanatory replies. According to King (1990),

> It was assumed that the variety of the questions would influence the effectiveness of the elaborated response. For example, a question such as, "How would you use…to…?" requires application of information in a specific context, whereas "What is a new example of …?" stimulates generation of novel examples. "Explain why…" calls for analysis of processes and concepts and involves translating terms into different vocabulary. "How does…affect…?" prompts responders to examine relationships among ideas. "Do you agree or disagree with this statement:…? Support your answer." asks for evaluation based upon criteria and evidence. (p. 669)

Both classes were given instruction in classroom questioning since it was a required topic in the education methods course they were taking. However, the students assigned to the discussion treatment received no further training in questioning. The students assigned to the questioning treatment received direct instruction in generating questions based on course material utilizing the set of question stems and were provided opportunities to practice the questioning responding strategy.

Both groups listened to the same lecture. Following the lecture, both groups were given 10 minutes to work in their small groups. The students in the questioning group were reminded to use their reciprocal questioning strategy. A comprehension test containing 10 multiple-choice items and five open-ended items was given immediately following the review session. King (1990) reported that the students in the questioning group outperformed the discussion group on lecture comprehension and answered the open-ended items with more detail and at a higher level than the discussion group.

Research conducted by Karakoc and Simsek (2004) showed that the teaching strategy used by the teacher had a significant effect on the learning strategies used by the student. The subjects were 32 students enrolled in the Faculty of Health Education at Ankara University. The students were divided into two groups. For six weeks, inquiry

teaching strategies were used with one group and expository teaching strategies were used on the other group.

Karakoc and Simsek (2004) reported, "It was found that while students using the inquiry teaching strategy began to use elaborative strategy more intensively, students using the expository teaching strategy began to use rehearsal and recall strategies more intensively" (p. 127). They concluded that the use of inquiry teaching strategies "facilitates, necessitates, or encourages the use of learning strategies which require thinking and interpreting" and advocated that "Inquiry teaching strategy should be used more in order to improve such student abilities as analysis, synthesis, and interpretation" (p. 127).

AVID specifically uses inquiry in tutoring sessions conducted during the AVID elective class. A study conducted by Graesser and Person (1994) investigated the frequency and qualitative characteristics of the questions asked in tutoring sessions of 27 college students in a research methods course and of 13 seventh grade students in an algebra course. Graesser and Person found that questions were approximately 240 times more frequent in tutoring sessions than in regular classroom settings. Tutors asked 1.5 times more questions than teachers in the regular classroom setting and therefore it was concluded that tutoring provides more of an opportunity for the student to participate in active inquiry.

As stated by Graesser and Person (1994), results show that "tutoring provides a social, cognitive, and pedagogical context for students to take more control over their learning and to correct their idiosyncratic knowledge deficits" (p. 129). Additionally, students may be more inquisitive in tutoring sessions without the fear of judgmental

remarks being made by peers. In short, the researchers concluded, students in tutoring sessions have more opportunities to ask questions pertaining to what they specifically need help mastering in an environment free of social pressures and therefore may learn more (Graesser & Person).

Collaborative, Subject-Specific Learning Groups

AVID uses collaboration, or cooperative learning, to bring students together to take responsibility for their learning (Arellanes et al., 2007). Cooperative learning provides students an opportunity to be heterogeneously grouped by many different aspects such as academic performance, race, gender, and language proficiency. Students work together to solve complex problems and complete tasks. As stated by Slavin and Cooper (1999), "the intent of cooperative work groups is to enhance the academic achievement of students by providing them with increased opportunity for discussion, for learning from each other, and for encouraging each other to excel"(p. 648). Cooperative learning is well documented in the literature as a strategy that enhances student achievement (Johnson & Johnson, 1999; Johnson, Johnson, & Taylor, 2001; Johnson, Johnson, & Smith, 2007; Marzano, Pickering, & Pollock, 2001; Slavin, 1983).

One of the first studies on cooperative learning was conducted by Johnson, Maruyama, Johnson, Nelson, and Skon (1981). The researchers compared the effects of cooperation, cooperation with intergroup competition, interpersonal competition, and individualistic efforts in promoting student achievement. A meta-analysis was conducted that reviewed 122 studies – which was every study available to them that used North American samples and that contained achievement or performance data and compared two or more of the four goal structures (Johnson et al., 1981).

The researchers offered four theoretical propositions as a result of their research synthesis. They stated the following:

1. Cooperation is superior to competition in promoting achievement and productivity for all subjects and all age groups and for tasks involving concept attainment, verbal and spatial problem solving, categorizing, retention and memory, motor performance, and guessing-judging-predicting;
2. Cooperation is superior to individualistic efforts in promoting achievement and productivity;
3. Cooperation without intergroup competition promotes higher achievement and productivity than cooperation with intergroup competition;
4. There is no significant difference between interpersonal competitive and individualistic goal structures on achievement and productivity (p. 57).

Johnson et al. (1981) concluded, "the overall effects stand as strong evidence for the superiority of cooperation in promoting achievement and productivity…educators may wish to considerably increase the use of cooperative learning procedures to promote higher student achievement" (p. 58).

Nearly two decades later, Johnson and Johnson (1999) continued to report that cooperative learning was superior to competitive and individualistic efforts in promoting student achievement. In fact, cooperative learning has been credited for not only contributing to academic gains but also for helping students establish more positive relationships (Gillies, 2008; Johnson et al., 2001; Slavin & Cooper, 1999).

According to Johnson and Johnson (1999), there are five essential elements in cooperative learning: (1) positive interdependence, (2) individual accountability, (3) face-to-face promotive interaction, (4) interpersonal and small group skills, and (5) group processing.

Furthermore, early research also indicated that cooperative learning was helpful to minority students. A study by Slavin and Oickle (1981) of 230 students (78 Black and 152 White) who were enrolled in ten English classes in grades six through eight in a rural

middle school. The participants were divided into two groups. The "Team group" consisted of four classes of 84 students and the "Non-Team group" consisted of six classes of 146 students. The percentage of Black students on each team was relatively the same.

The Team treatment was a cooperative learning method called Student Teams-Achievement Divisions (STAD). Students were divided into four to five member teams. "The teams were made up of all levels of academic achievement, sex, and race in the proportion they represented in the class as a whole" (p. 176). Following a presentation by the teacher, the Team groups worked together on worksheets but were then individually quizzed. The Non-team members studied the same worksheets and took the same quizzes but the worksheets were completed individually rather than in teams.

The results of the post-test showed that the Black students in the Team classes not only made higher achievement gains than the Non-Team students but made higher achievement gains than the White students in their classes. Additionally, the achievement gap between the Black and White students nearly disappeared. In contrast, the achievement gap in the Non-Team classes remained large.

Marzano et al. (2001) advocated the use of cooperative learning as a strategy for increasing student achievement and offered the following generalizations: Grouping students homogeneously based on ability level should be done in moderation; the size of the cooperative groups should be kept small; and "cooperative learning should be applied consistently and systematically, but not overused" (p. 88). They stated, "of all classroom grouping strategies, cooperative learning may be the most flexible and

powerful…teachers can use cooperative learning in a variety of ways in many different situations" (p. 91).

High achieving students can also benefit from cooperative learning activities. A study conducted by Johnson et al. (2001) comparing the effects of cooperative learning and individualistic learning on achievement of 34 high-ability fifth-grade students showed that the students involved in the cooperative condition scored higher on both recall and higher level reasoning measures than the students in the individualistic condition. Additionally, the students in the cooperative condition demonstrated greater cohesion and higher academic self-esteem.

Harskamp, Ding, and Suhre (2008) acknowledged that cooperative learning may provoke a higher level of thinking among participants but conducted a study to determine if female students learn to solve science problems better depending on the gender of their partner. The participants were 62 tenth grade high school students (31 males, 31 females) from three physics classes. Students were randomly paired with a member of their class. "In each class there were three types of dyads on the basis of gender: the mixed-gender condition group (MG) included 15 pairs; the female-female group (FF) included eight pairs; and the male-male group (MM) also had eight pairs" (p.311).

All students received training on how to work as a team and received the same problems in four 50-minute sessions. Results from pre and post-tests showed that partner gender was a significant factor in learning to solve physics problems. "Within mixed-gender pairs, males outperformed females. However, females in all-female pairs did just as well as males…females appear to do better in all-female dyads than in mixed-gender dyads when learning to solve physics problems" (p. 316).

Reading as a Learning Tool

The No Child Left Behind Act (2001) held schools accountable for closing the achievement gap and ensuring that all students reached academic proficiency. As schools were held to high accountability standards, using reading skills to learn content was vital to student success. Dicker and Little (2005) stated, "If schools are accountable for the success of all students but do not have a strong school-wide focus on literacy, students with reading difficulties can be left behind at the secondary level" (p. 277). The AVID program developers supported the teaching of reading in the content area and stressed that teachers must scaffold reading instruction to help students become confident in their reading comprehension. They also stated that connecting to prior knowledge, understanding text structure, and using text-processing strategies during and after reading are strategies that must be taught to students to ensure successful comprehension (Arellanes et al., 2007).

Literature supports that teachers often lack the knowledge needed to help students develop literacy skills or have been reluctant to integrate literacy instruction in their content areas (Bintz, 1997; Dupuis, Askov, & Lee, 1979; Hall, 2005; Taylor, 2002;). Hall's (2005) review of the research on teacher attitudes and beliefs regarding the teaching of content area reading showed that experienced teachers as well as those in training did not take responsibility for their students' lack of reading skills. However, it appeared that experienced content area teachers were willing to learn how to teach reading while teachers in training did not feel that it was their responsibility. Hall stated, "This is an interesting difference and appears to indicate that content area teachers' beliefs about their role as teachers of reading may shift after they enter the classroom"

(p. 408). Hall concluded that all content area teachers need training, time, and support to effectively incorporate reading instruction in their content areas.

Cantrell, Burns, and Callaway (2009) also conducted a study of content area teachers' perceptions about literacy teaching and learning. The participants were 31 teachers (23 females and 8 males) from six different school sites who taught core classes in grades six and nine and participated in the Content Literacy Project (CLP), a year-long professional development program designed to assist teachers in implementing literacy strategies in their content areas. The professional development began with a five-day summer institute in which participants were trained in a variety of instructional strategies based on five domains: "(a) vocabulary development, (b) reading comprehension, (c) fluency, (d) writing to learn, and (e) writing for knowledge transfer" (p. 79). The professional development continued over the following year as CLP trainers coached teachers at their school site.

Of the 31 participants, 28 teachers agreed to be interviewed regarding their perceptions on "(a) content area instruction and literacy, in general, (b) the teachers' personal experiences with teaching literacy and with the content literacy project, and (c) the impact of the content literacy project on school-level achievement" (p. 81).

The findings reported by Cantrell et al. (2009) showed that teachers in this study (seven science teachers, seven mathematics teachers, four social studies teachers, eight language arts teachers, and two reading teachers) had "varied perceptions about literacy teaching, student literacy learning, and their roles in literacy instruction" (p. 82). Several teachers expressed that they were much more prepared to teach literacy in their content area as a result of their participation in the CLP training. Cantrell et al. reported, "64% of

teachers said they felt well-equipped to teach literacy to most students, 68% of respondents still expressed serious doubts about their abilities to meet the needs of students with reading difficulties" (p. 83). Therefore, Cantrell et al. emphasized the importance of providing content area teachers with professional development on incorporating literacy strategies in their classrooms that would assist them in meeting the needs of struggling readers.

Ness (2008) conducted a study to determine how middle and high school teachers supported struggling readers in acquiring content in their science and social studies classrooms. By analyzing 2400 minutes of classroom observation and open-ended interviews (for two teachers in each subject area of middle school science, middle school social studies, high school science, and high school social studies), Ness found that support for struggling readers came through teacher-dominated instruction, multiple presentations, multiple modalities, alternate sources of text, and heterogeneous grouping. Teachers did not incorporate literacy strategies to assist students in improving comprehension, but rather provided remediation only for content.

Ness concluded that teachers felt pressure to cover content to prepare students for standardized testing and that teachers in this study chose to teach content rather than reading comprehension strategies. She suggested that if teachers knew how reading comprehension strategies would help students understand and retain their content, they "may be more likely to teach students to summarize, clarify, predict, generate questions, and monitor their understanding" (p. 92).

Alfassi (2004) stated, "reading is a complex cognitive activity that is indispensible for adequate functioning in society. To enter the present literate society, students must

know how to learn from reading" (p. 171). Explicitly teaching students research based literacy strategies improves student learning. Incorporating before-reading strategies, during-reading strategies, and after-reading strategies assists students in comprehending text in all content areas (Blair, Rupley, & Nichols, 2007; Dieker & Little, 2005; Taylor & Collins, 2003,).

Taylor and Gunter (2006) developed a step-by-step process for developing a "fail-safe approach to literacy" that results in increased student achievement. The authors identified 11 steps to creating a fail-safe literacy system:

1. Commit to fail-safe literacy leadership
2. Agree on common language to drive instruction
3. Agree on nonnegotiable expectations of daily practice
4. Create exemplars and nonexemplars
5. Clarify roles and responsibilities
6. Ask what is working and what is not
7. Ask is there anything else that is important that should be considered
8. Create a support system
9. Communicate the fail-safe literacy system
10. Monitor the fail-safe literacy system
11. Celebrate successes (Taylor & Gunter, 2006).

Their *K-12 Literacy Leadership Fieldbook* provides school personnel with a proven process to improve literacy throughout the school and help students "become joyful, independent readers, writers, and content learners" (p. 2).

Research on AVID

AVID was founded in 1980 by Mary Catherine Swanson, an English teacher at Clairemont High School in San Diego, California. She originally created AVID as a way to prepare underachieving disadvantaged students earn the qualifications for acceptance in college (Swanson, 1989). The program extended from one classroom in 1980 to

serving “nearly 200,000 students in more than 2,700 middle and high schools in 39 states” in 2007(Nelson, 2007, p. 73).

Hubbard and Mehan (1999) reported that from 1980 until 1995, students recruited for AVID were low-income students from racial groups historically underrepresented in colleges and universities. They explained that after 1995 the AVID literature simply stated that AVID recruits “students in the middle” and that this change was partially due to changes in California law and feedback received from educators at new school sites in Kentucky. They reported, “In June 1995, the Regents of the University of California passed a resolution forbidding the nine campuses of the University of California system from using race, gender, and ethnicity as supplemental criteria in admissions decisions” (p. 95). The authors stated that schools they studied in Kentucky favored the change in AVID’s recruitment policy and that those schools recruited students regardless of race or ethnicity. They explained that Blacks tend to reside in the western region of Kentucky so students recruited for AVID in eastern Kentucky “are almost exclusively from low-income White families” (p. 96).

Swanson (2005) described potential AVID students as those students in the middle who tend to be forgotten. She described the forgotten-middle as “the silent majority—the kids who come to school regularly, sit in the back of the class, rarely say anything, don’t cause trouble, and get by with C’s” (p. 31). Swanson stated that these students are the majority because they take up a large part of the middle two quartiles. They will graduate from high school but will not be prepared for college.

Swanson (2005) advocated for a detracking program that will make all students college ready. She stated, “We must start by abandoning the mind-set that labels so many

students as not being college material. The expectation ought to be that all students, with few exceptions, will complete the rigorous course loads needed to get into a four-year college" (p.33).

Research on AVID conducted in California and Texas has shown that AVID benefits the students directly involved in the program as well as schools implementing the program (Mehan, Hubbard, Lintz, & Villanueva, 1994; Oswald, 2001; Watt, Powell, Mendiola, & Cossio, 2006). According to Mehan et al., the college enrollment record of students who have participated in AVID provides evidence that underrepresented students can participate in an academic curriculum as an alternative to the common practice of placing these students in vocational or general education tracks. Nelson (2007) stated that when educators begin to extend college-preparatory opportunities and support to more students, the students rise to the challenge and succeed at higher rates than they did in the remedial and general education tracks. Mehan et al. reported that enrolling in AVID provides economically disadvantaged students the social and cultural capital at school that more economically advantaged children receive at home.

Oswald (2001) completed a program evaluation of AVID in the Austin Independent School District (AISD) in Texas. AVID programs serving nearly 400 students in eight schools were evaluated using multiple techniques. After analyzing student data; surveying teachers, counselors, and administrators; conducting informal observations; and conducting in-depth interviews, she reported that AVID students showed greater participation in advanced classes, were more involved in school activities, and passed the Texas Assessment of Academic Skills exit examination at high rates, ultimately meeting the program goals. However, a quantitative study by Rorie (2007)

comparing the performance of 48 AVID students from 4 schools in the Pine View School District in Colorado with a matched set of non-AVID students from the same 4 schools in the areas of reading, writing, and mathematics found no significant difference on the ninth and tenth grade Colorado Student Assessment Program, the Plan test, the ACT, or the eleventh grade writing assessment.

Watt et al. (2006) conducted a study over a 4-year period comparing 10 Texas high schools in 5 districts that implemented the AVID program as part of a comprehensive school reform with non-AVID high schools. The study was conducted to determine if school-wide or district-wide accountability measures improved for AVID high schools and districts compared to non-AVID high schools and districts. Researchers found schools and districts that implemented AVID showed that student performance improved over four years of AVID implementation. However, even though the non-AVID schools and districts had similar student demographics, they did not show similar improvements.

Watt, Huerta, and Lozano (2007) conducted a comparison study of AVID and Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR UP) for tenth grade students in two high schools in the Rio Grande Valley of Texas. The purpose of this study was to investigate if a difference existed in the college preparation of students who participated in college preparatory programs and those students who did not participate in college preparatory programs. Four groups of students were examined: 40 students in AVID, 40 students in GEAR UP, 22 students in both AVID and GEAR UP, and a control group of 40 students not in either program. It was hypothesized that AVID and GEAR UP students would exhibit higher levels of academic preparation, educational

expectations and anticipations, and knowledge of college entrance requirements. The preliminary findings were inconclusive. The authors reported that only the AVID group was significantly better in academic preparation than the control group. The other two groups that participated in college preparatory programs were not. AVID students were enrolled in more advanced course work than the other groups.

Other research on AVID included studies that measure factors other than student performance. One study focused on the aspects of the AVID program that contributed to students remaining in the program for all four years of high school. The authors noted that students remained in the AVID program because of strong personal relationships that were developed with the AVID teachers and the family-like atmosphere that contributed to positive student morale and self-esteem. This study also noted that students believed that tutoring was one of the advantages for staying in the program (Watt, Johnston, Huerta, Mendiola, & Alkan, 2008).

AVID and the College Board

AVID and the College Board have partnered to assist schools in providing students with access to rigorous curriculum in college-preparatory classes and the tools necessary for college success (Negroni, 2004). Gira (2003) reported, the College Board Florida Partnership began in 1999 when then Florida's Governor Jeb Bush and College Board President Gaston Caperton met to discuss strategies that would provide more students access to college especially underrepresented students. Gira noted that AVID was a good fit for the College Board Florida Partnership because the goals of each organization "are connected both in terms of process and outcomes" (p. 5).

Negroni (2004) stated that the College Board and AVID go well together. She explained, "AVID provides students with the writing and study skills they need to tackle rigorous course work. The College Board provides rigorous curricula for students and extensive professional development for educators" (p. 7). Additionally, he pointed out that "AVID and the AP Program are two prongs that educators are finding effective in helping students gain the skills and knowledge to be admitted to college and to succeed once they are there" (p. 6).

Swanson (2004) advocated that AVID and the College Board should be the model for redesigning secondary schools. She outlined a framework that districts should follow and stressed the importance that the focus of all redesign efforts should be on student achievement. Swanson stated, "When school districts combine College Board and AVID strategies to redesign their schools, the number of high-level academic classes increase, standardized test scores rise, AP qualifying rates increase, and more students enroll in college" (p. 5).

Summary

The purpose of this review was to examine the literature relevant to the AVID program as well as the impact of ethnicity, gender and economic status on academic achievement. The AVID program was developed in part as a response to the educational practice of tracking, therefore this topic was also included in the literature review. The literature regarding tracking reflects differences in educational philosophy, consequently there are advocates (Hallinan, 1994; Oakes, 1992; Rubin & Noguera, 2004; Slavin, 1990) as well as critics (Hallinan, 1996; Oakes, 1992; Slavin, 1990; Smith-Maddox &

Wheelcock, 1995). A growing body of research proposed "detracking" as a way to close the achievement gap (Burris et al., 2008; Burris & Garrity, 2008; Burris & Welner, 2005; Goodlad & Oakes, 1988; Oakes & Lipton, 1992; Slavin, 1995). The common theme found in the detracking literature is to ensure that all students are provided with equal access to knowledge that is typically found in "high track" classrooms (Burris et al., 2008; Burris & Welner, 2005).

According to Bali and Alvarez (2004), "one of the most pressing concerns in American public education today is the so-called race gap in student achievement test scores" (p. 393). On average, Asian students outperformed White students, and White students outperformed Black and Hispanic students in grades and on standardized tests (Kao & Thompson, 2003). Wing (2007) advocated for dispelling myths and stereotypes in our public schools and for implementing programs and services to address the needs of all students.

In addition, research showed that there are gender differences in educational achievement particularly in the areas of reading and mathematics with females performing better than males in reading and males performing better than females in mathematics, although the achievement gap for mathematics appears to be decreasing (Geist & King, 2008; Husain & Millimet, 2009; Ma, 2008; Marks, 2008). Finally, many studies have been conducted that showed low socioeconomic status is related to low student performance on state and national tests (Caldas & Bankston III, 1997; Frederickson & Petrides, 2008; Sackett, Kuncel, Arneson, Cooper & Waters, 2009; Strenze, 2007; Tate, 1997). Kao and Thompson (2003) argued "parental education and

family income is probably the best predictor of eventual academic outcomes among youth" (p. 431).

The instructional methodologies used in the AVID program have been designed to assist students in meeting the high standards of a rigorous curriculum. They include: (1) writing as a tool of learning, (2) inquiry method, (3) collaborative, subject-specific learning groups, and (4) reading as a tool of learning. These methodologies are labeled WICR (writing, inquiry, collaborative, reading) strategies (Arellanes et al., 2007), and are well supported in the literature as effective strategies for increasing student achievement

Research on AVID has shown that AVID benefits the students directly involved in the program as well as schools implementing the program (Mehan, Hubbard, Lintz, & Villanueva, 1994; Oswald, 2001; Watt, Powell, Mendiola, & Cossio, 2006). AVID and the College Board have partnered to assist schools in providing students with access to a rigorous curriculum in college-preparatory classes and the tools necessary for college success (Negroni, 2004). Swanson (2004) advocated that AVID and the College Board should be the model for redesigning secondary schools. While the literature is supportive of the efficacy of the AVID program (Oswald, 2001;Watt, Johnston, Huerta, Mendiola, & Alkan, 2008), no investigations were found that utilized the Florida Comprehensive Assessment Test as an outcome measure.

Chapter 3 explains the methodological aspects of this study. Specifically, it describes the population, instrumentation, data collection procedures, and data analysis techniques.

CHAPTER 3
METHODOLOGY

Introduction

The purpose of this study was to examine the relationship of student participation in AVID and student academic performance. More specifically, this study was conducted to determine if there was a relationship in student performance on the Florida Comprehensive Assessment Test (FCAT) in reading, writing, and mathematics and participation in the AVID program during the first two years of high school. A comparison of FCAT performance of AVID students and non-AVID students who had similar demographics (i.e., race, gender, and economic status) was made.

This chapter contains the methodology used to answer the research questions and contains the following sections: (a) statement of the problem, (b) population, (c) instrumentation, (d) data collection, and (e) data analysis.

Statement of the Problem

During times when resources for education are scarce, educational leaders must make decisions regarding implementation of programs that will have the greatest impact on student achievement. Because programs can be relatively expensive, leaders are charged with the task of determining what programs are effective in improving student achievement and worthy of investment of resources.

For example, the AVID program requires a considerable amount of financial and human resources. General cost information was provided by the Assistant Director of Marketing and Communications at the AVID Center Headquarters who reported that AVID can cost a district nearly $30,000 for one school site for one school year (S.

Baratte, personal communication, July 24, 2009). This cost includes a membership fee, curriculum materials, staff development, summer institute trainings, and a professional service fee for support and training. More detailed financial information was considered confidential between AVID and participating districts or schools and was not available for this study. Therefore, the problem addressed in this study was to determine the extent to which student participation in the AVID program related to student achievement in mathematics, reading, and writing as measured by the FCAT in selected Central Florida high schools.

Population

The population for this study consisted of students from six high schools in two Central Florida school districts who participated in the AVID program during the 2007-2008 and 2008-2009 school years and a demographically matched set of students from these high schools who did not participate in the AVID program during the same two school years. As shown in Table 2, students in the AVID program at the respective schools were: School A, 36; School B, 28; School C, 15; School D, 17; School E, 33; School F, 34. AVID students that could not be matched were eliminated from the study. Final numbers used in the data analysis are presented in Chapter 4.

Table 2
AVID Students by District and School

District and Schools	Number of AVID Students
District 1	
School A	36
District 2	
School B	28
School C	15
School D	17
School E	33
School F	34
Total	163

School District 1

School District 1 was located approximately 70 miles north of Tampa on the west coast of Central Florida. In 2008, the population was approximately 141,000 people with a racial makeup of 94.0% White, 4.4% Hispanic or Latino, 3.3% Black, 1.2% Asian, 1.1% Multiracial, and 0.3% American Indian and Alaska Native (U.S. Census Bureau, 2009).

According to the 2008-2009 Florida School Indicator Report, School District 1 enrolled 16,032 students in pre-kindergarten through 12th grade with a racial makeup of 84% White, 5% Hispanic, 4.5% Black, 4.5% Multiracial, 1.6% Asian, and 0.4% Indian. Approximately 42% of the student population was on free or reduced lunch (FLDOE, 2009b).

School District 1 had 11 elementary schools, four middle schools, three high schools, and five other schools including one alternative school, one vocational school, one charter school, and two special school sites.

School District 2

School District 2 was located on the east coast of Central Florida. In 2008, the estimated population was nearly 500,000 people with a racial makeup of 86.3% White, 10.7% Hispanic or Latino, 10.5% Black, 1.5% Asian, 1.3% Multiracial, and 0.4% American Indian and Alaska Native (U.S. Census Bureau, 2009b).

According to the 2008-2009 Florida School Indicator Report, School District 2 enrolled 63,166 students in pre-kindergarten through 12th grade with a racial makeup of 63.2% White, 15.8% Hispanic, 14.5% Black, 4.5% Multiracial, 1.7% Asian, and 0.2% Indian. Approximately 47% of the student population was on free or reduced lunch (FLDOE, 2009b).

School District 2 had 45 elementary schools, 13 middle schools, nine high schools, seven alternative education schools, and eight charter schools. Table 3 displays the demographics for both school districts.

Table 3
School District Characteristics

Demographic Descriptors	District 1	District 2
Total student population	16,032	63,166
Total schools		
Elementary	11 (47.8%)	45 (54.9%)
Middle	4 (17.4%)	13 (15.9%)
High	3 (13.0%)	9 (10.9%)
Alternative	1 (4.4%)	7 (8.5%)
Other	4 (17.4%)	8 (9.8%)
Student race/ethnicity		
White	84.0%	63.2%
Hispanic	5.0%	15.8%
Black	4.5%	14.5%
Multiracial	4.5%	4.5%
Asian	1.6%	1.7%
Indian	.4%	.2%
Economically Disadvantaged	42.0 %	47.0%

Because data was analyzed in aggregate, individual school size was not reported. However, school sizes ranged from approximately 1000 – 3000 students.

Instrumentation

The Florida Comprehensive Assessment Test (FCAT) was administered to students in grades 3-10. The test was designed to measure selected benchmarks from the Sunshine State Standards in Reading, Mathematics, Science, and Writing (Florida Department of Education, 2004). This study used results from the grade 8 and grade 10 Writing FCAT, and the grade 8, 9, and 10 Reading and Mathematics FCAT.

The FCAT Writing test was administered in grades 4, 8, and 10 and the item format was an essay. FCAT Writing scores ranged from 1 to 6 with 1 being the lowest

and 6 being the highest. Each student received an individual score for his or her essay (Florida Department of Education, 2008).

The Reading and Mathematics FCAT was administered to students in grades 3 through 10. The Reading and Mathematics tests contained multiple-choice items at each grade level. The Reading test at grades 4, 8, and 10 also included short-response and extended-response items. The Mathematics test contained gridded-response items for grades 5 through 10. Short-response and extended-response items were included on the test in grades 5, 8, and 10 (Florida Department of Education, 2004).

Student scores for the Reading and Mathematics FCAT were reported in three ways. Students were given a scale score ranging from 100 to 500 for each test. The scale score was divided into five categories called achievement levels. The achievement levels ranged from 1 to 5 with 1 being the lowest and 5 being the highest. Finally, students were given a developmental scale score ranging from 0 to 3000. Developmental scale scores were utilized in this study to show student progress over time and enabled comparisons from one grade level to the next (Florida Department of Education, 2004). The developmental scale scores were created by identifying the scaled scores associated with each FCAT achievement level and then linking a developmental score for these critical values. This was accomplished via the Stocking Lord approach which creates a common scale based upon estimates derived from item response theory (Florida Department of Education, 2006).

FCAT Reliability

The Florida Department of Education (2004) provided evidence that the FCAT was a highly reliable test. The reliability for the FCAT was measured for internal

consistency using Cronbach's Alpha and Item Response Theory (IRT) marginal reliabilities. Table 4 displays the 2003 Cronbach's Alpha and IRT marginal reliability of FCAT for grades 8, 9, and 10 in Reading and Mathematics.

Table 4
Florida Comprehensive Assessment Test Reliability (2003)

	Reading			Mathematics	
Grade	Cronbach's Alpha	Item Response Theory	Grade	Cronbach's Alpha	Item Response Theory
8	.89	.90	8	.93	.93
9	.89	.89	9	.89	.90
10	.88	.88	10	.92	.92

FCAT Validity

The FCAT was designed to measure students' knowledge of the Sunshine State Standards. The Florida Department of Education implemented the following steps to ensure high content validity of the FCAT:

1. Educators and citizens judged the standards and skills acceptable.
2. Item specifications were written.
3. Test items were written according to the guidelines provided by the item specifications.
4. The items were pilot tested using randomly selected groups of students at appropriate grade levels.
5. All items were reviewed for cultural, ethnic, language, and gender bias and for issues of general concern to Florida citizens.
6. Instructional specialists and practicing teachers reviewed the items.
7. The items were field tested to determine their psychometric properties.
8. The tests were carefully constructed with items that met specific psychometric standards.
9. The constructed tests were equated to the base test to match both content coverage and test statistics. (Florida Department of Education, 2004, p. 26)

Data Collection

A request to conduct research was submitted to the two school districts and approval was granted. The IRB process was completed and the IRB determined that this study was not human subjects research, and therefore the University of Central Florida IRB review and approval was not required (See Appendix A).

The researcher contacted each school principal by phone to schedule a time to meet with the appropriate personnel from each school site to gather student demographic and achievement data. The researcher intended to visit each school personally to obtain the necessary data to conduct the research study. While all principals agreed to have their schools participate in the research study, several principals in one district expressed concern about providing the researcher with access to confidential student information. As a result, the Coordinator of Program Accountability and Evaluation and the Performance Measurement Specialist in that district provided the researcher with all data from the identified high schools in an Excel spreadsheet. School names were replaced with School A, School B, etc., and student names and numbers were replaced with 1, 2, 3, etc. The template used for the Excel spreadsheet is contained in Appendix B.

In addition to gathering student data, the researcher interviewed the AVID coordinator at each school by phone to determine how each of the 11 AVID essentials was implemented at the school sites. The questions, which were used to guide the interviews, can be found in Appendix C.

Data were collected for students who entered the ninth grade in 2007-2008 and remained continuously enrolled in the same school for tenth grade in the 2008-2009 school year. Included were the following student demographic and achievement data:

1. Student identification number (This number was changed to 1, 2, 3. . .)
2. Name of High School (changed to School A, B, C. . .)
3. AVID participation (AVID participant or non-AVID participant)
4. Gender
5. Ethnicity
6. Economic status (free and reduced lunch program participant or non-free and reduced lunch program participant)
7. Limited English Proficiency (LEP) status
8. Exceptional Student Education (ESE) status
9. Eighth grade FCAT developmental scale score in reading
10. Eighth grade FCAT developmental scale score in mathematics
11. Eighth grade FCAT writing score
12. Ninth grade FCAT developmental scale score in reading
13. Ninth grade FCAT developmental scale score in mathematics
14. Tenth grade FCAT developmental scale score in reading
15. Tenth grade FCAT developmental scale score in mathematics
16. Tenth grade FCAT writing score
17. Tenth grade GPA (weighted and un-weighted)
18. Tenth grade English course
19. Tenth grade mathematics course
20. Tenth grade science course
21. Tenth grade social studies course

Matching AVID and Non-AVID Students

Students participating in the AVID program were matched with non-AVID participants from the same school for each school site. Below is an example of how the researcher performed the matching for school A to determine the matched set for Research Question 1 (FCAT mathematics) followed by the matching for Research Question 2 (FCAT reading) and Research Question 3 (FCAT writing):

Using the completed Excel spreadsheet for School A, the researcher sorted the data by tenth grade mathematics course and eighth grade FCAT mathematics developmental scale score. Each AVID student was then matched to a non-AVID student by matching tenth grade mathematics course, gender, ethnicity, economic status, and FCAT eighth grade mathematics developmental scale score. For example, if AVID Student 1 was enrolled in Geometry Honors and was a White male on free and reduced lunch with an eighth grade FCAT mathematics developmental scale score of 1918, that student was matched with a non-AVID student who was enrolled in Geometry Honors and was a White male on free and reduced lunch with an eighth grade FCAT mathematics developmental scale score as close as possible to, if not exactly at, 1918.

To perform the matching for Research Question 2 (FCAT reading), the researcher sorted the Excel spreadsheet data by tenth grade English course and eighth grade FCAT reading developmental scale score. If AVID Student 1 was enrolled in English II honors and was a White male on free and reduced lunch with an eighth grade FCAT reading developmental scale score of 1918, that student would be matched with a non-AVID student who was enrolled in English II honors and was a White male on free and reduced

lunch with an eighth grade FCAT reading developmental scale score as close as possible to, if not exactly at, 1918.

In performing the matching for Research Question 3 (FCAT writing), the researcher sorted the Excel spreadsheet data by tenth grade English course and eighth grade FCAT writing score. If AVID Student 1 was enrolled in English II honors and was a White male on free and reduced lunch with an eighth grade FCAT writing score of 4.0, then that student would be matched with a non-AVID student who was enrolled in English II honors and was a White male on free and reduced lunch with an eighth grade writing score of exactly 4.0. The researcher followed the same matching procedure for schools B, C, D, E, and F.

Data Analysis

The researcher transferred all collected data from Excel spreadsheets to SPSS (version 16.0). For Research Question 1 (to what extent was a mean difference from eighth to tenth grade FCAT mathematics developmental scale score gains for students based on participation in AVID, and their ethnicity, gender, and economic status), a factorial ANOVA was conducted. The dependent variable was the FCAT mathematics developmental scale score gain. The independent variables were participation in AVID, ethnicity, gender, and economic status.

To answer Research Question 2 (to what extent was a mean difference from eighth to tenth grade FCAT reading developmental scale score gains for students based on participation in AVID, and their ethnicity, gender, and economic status), a factorial ANOVA was conducted. The dependent variable was the FCAT reading developmental

scale score gain. The independent variables were participation in AVID, ethnicity, gender, and economic status.

For Research Question 3 (to what extent was there a mean difference in tenth grade FCAT writing scores for students based on participation in AVID, and their ethnicity, gender, and economic status), a factorial ANOVA was conducted. The dependent variable was the tenth grade FCAT writing score, and the independent variables were participation in AVID, ethnicity, gender, and economic status.

Summary

This chapter has presented the methodology used to conduct the study. The purpose of the study and the statement of the problem were restated. The population for this study consisted of students from six schools in two school districts who participated in the AVID program during the 2007-2008 and 2008-2009 school years and a demographically matched set of students from these high schools who did not participate in the AVID program during the same two school years. The reliability and validity of the instrumentation was presented, and the data collection procedures were detailed. Finally, the methods used to analyze the data were outlined for each research question. Chapter 4 contains the results of the data analysis.

CHAPTER 4
ANALYSIS OF THE DATA

Introduction

The purpose of this study was to examine the relationship of student participation in AVID and student academic performance. More specifically, this study was conducted to determine if there was a mean difference in student performance on the Florida Comprehensive Assessment Test (FCAT) in mathematics, reading, and writing, and participation in the AVID program during the first two years of high school. A comparison of FCAT performance of AVID students and non-AVID students who had similar demographics (race, gender, and economic status) was made using demographic and achievement data obtained from six high schools in two central Florida public school districts. These schools had a certified AVID program during the 2007-2008 and 2008-2009 school years.

The results of the data analysis have been organized around the three research questions, which are:

1. To what extent is there a mean difference from eighth to tenth grade FCAT mathematics developmental scale score gains for students based on participation in AVID, and their ethnicity, gender, and economic status?
2. To what extent is there a mean difference from eighth to tenth grade FCAT reading developmental scale score gains for students based on participation in AVID, and their ethnicity, gender, and economic status?

3. To what extent is there a mean difference in tenth grade FCAT writing scores for students based on participation in AVID, and their ethnicity, gender, and economic status?

Included for each question are (a) a discussion of the population and the exclusion of students due to failure to match, (b) the baseline group equivalence, (c) the results of the factorial ANOVA, and (d) descriptive statistics of the independent variables for the FCAT mathematics and reading developmental scale score gains and the tenth-grade FCAT writing score means.

Research Question 1

Research Question 1: To what extent is there a mean difference from eighth to tenth grade FCAT mathematics developmental scale score gains for students based on participation in AVID, and their ethnicity, gender, and economic status?

Exclusions Due to Failure to Match

There were some situations of failure to match where not all AVID students at each school could be matched with non-AVID students. The reasons for non-matching included (a) differences in tenth grade mathematics course taken, (b) differences in ethnicity, and (c) differences in free and reduced lunch status. In these situations, the students who could not be matched were eliminated from the study.

Based on failure to match, School A had 17 of 36 AVID students eliminated, School B had 11 of 28 AVID students eliminated, School C had 5 of 15 AIVD students eliminated, School D had 10 of 17 AVID students eliminated, School E had 14 of 33 AVID students eliminated, and School F had 6 of 34 AVID students eliminated. In all cases, AVID students were eliminated because they could not be matched with non-AVID students from that same school.

As shown in Table 5, a total of 200 students (100 AVID and 100 non-AVID) were used in the data analysis for Research Question 1. Participants included 86 (43%) males and 114 (57%) females. There were 156 (78%) White students and 44 (22%) non-White students. Additionally, there were 88 (44%) economically disadvantaged students and 112 (56%) non-economically disadvantaged students. In each case, equal numbers of AVID and non-AVID students were represented.

Table 5
Demographics of Participants for Mathematics (Frequencies and Percentages)

	AVID (*n* = 100)	Non-AVID (*n* = 100)
Gender		
Male	43 (43%)	43 (43%)
Female	57 (57%)	57 (57%)
Student race/ethnicity		
White	78 (78%)	78 (78%)
Non-White	22 (22%)	22 (22%)
Economic status		
Economically Disadvantaged	44 (44%)	44 (44%)
Non-Economically Disadvantaged	56 (56%)	56 (56%)

Baseline Group Equivalence

Students were matched by gender, ethnicity, and economic status but were not evenly matched on eighth grade mathematics FCAT developmental scale score. For example, an AVID student from School A enrolled in geometry honors was a White female, with non-free/reduced lunch status and an eighth grade FCAT mathematics developmental scale score of 1878. This student was matched with a non-AVID student from the same school who was a White female with non-free/reduced lunch status enrolled in geometry honors and an eighth grade FCAT mathematics developmental scale score of 1910. Thus, to determine group equivalence at baseline, i.e., eighth grade, an independent *t*-test was conducted to determine if there was a difference in the eighth grade FCAT mathematics developmental scale score means between the AVID and the non-AVID students. The test was conducted using an alpha of .05. The null hypothesis was that there was no difference in the eighth grade FCAT mathematics developmental scale score means between the AVID students and non-AVID students.

The assumption of normality was tested and met for the distributional shape of the dependent variable for the AVID students. Review of the Shapiro-Wilk's test for normality (W = .979, p = .112), skewness (-.499) and kurtosis (.604) statistics, and the Q-Q plot indicated that normality was a reasonable assumption for the AVID students. Although the boxplot indicated three cases were potential outliers, they were determined to be legitimate values and thus were retained.

The assumption of normality was also tested and met for the distributional shape of the dependent variable for the non-AVID students. Review of the Shapiro-Wilk's test for normality (W= .978, p = .096), skewness (-.568) and kurtosis (.565) statistics, and the Q-Q plot indicated that normality was a reasonable assumption for the non-AVID students. Although the boxplot indicated two cases were potential outliers, they were determined to be legitimate values and thus were retained.

Levene's test indicated that the assumption of homogeneity of variances was met (F = .255, p = .614). No significant difference existed (t (198) = -.587, p = .558) between the mean eighth grade FCAT mathematics developmental scale scores of AVID students (n = 100, M = 1933.06, SD = 105.837) and non-AVID students (n = 100, M = 1941.51, SD = 97.683). The 95% confidence interval for the difference between means was –36.852 to 19.952. The effect size was calculated by eta squared and found to be .00173 indicating that approximately .1% of the variance of eighth grade FCAT mathematics developmental scale score means could be accounted for by whether the student was an AVID student or a non-AVID student. Since the results of the independent t- test showed no significant difference in the eighth grade FCAT mathematics developmental scale

score means between AVID students and non-AVID students, the results suggest that the AVID and non-AVID students were evenly matched for Research Question 1.

Factorial ANOVA

A factorial ANOVA was performed to determine if there was a mean difference from eighth to tenth grade FCAT mathematics developmental scale score gains for students based on participation in AVID, and their ethnicity, gender, and economic status. The test was conducted using an alpha of .05. The null hypothesis was that there was no difference in mathematics developmental scale score gains, on average, between the AVID students and non-AVID students, and their ethnicity, gender, and economic status.

The assumptions of the test were reviewed and met by examining the unstandardized residuals. All indices suggested that normality was a reasonable assumption including skewness (.418), kurtosis (1.475), the histogram, Q-Q plots, and the Shapiro-Wilk's test of normality (D = .978, p = .003). Even though the Shapiro-Wilk's test was statistically significant, the other forms of evidence suggested normality. Given the sample size, the results should still be relatively robust to non-normality (Lomax, 2007). Based on Levene's test of equality of variances, the variances were assumed to be homogeneous, F (15, 184) = .847, p = .625. A dot plot of unstandardized residual values by group was created to determine if there were patterns to the data that may suggest a violation of independence. Based on the dot plots, there were no observable trends and, therefore, independence was a reasonable assumption.

The results of the 2 x 2 x 2 x 2 factorial ANOVA suggested that there was not a statistically significant difference in mathematics developmental scale score gains, on

average, for students in AVID and students not in AVID or any interaction of gender, ethnicity, or economic status. The results are shown in Table 6.

Table 6
Factorial Analysis of Variance of Mean Gain Scores for FCAT Mathematics

Variables	*F* (1, 184)	*p*	eta squared
AVID/Non-AVID	1.951	.164	.0099
Gender	.117	.732	.00059
Ethnicity	.564	.454	.0028
Economic status	.255	.614	.0013
Gender, ethnicity	2.928	.089	.015
Gender, economic status	1.315	.253	.0067
Gender, AVID/Non-AVID	.609	.436	.0031
Ethnicity, economic status	1.969	.162	.0100245
Ethnicity, AVID/Non-AVID	.432	.512	.0022
Economic status, AVID/Non-AVID	.022	.883	.00011
Gender, ethnicity, economic status	.155	.694	.00079
Gender, ethnicity, AVID/Non-AVID	.829	.364	.0042
Gender, economic status, AVID/Non-AVID	.072	.788	.00037
Ethnicity, economic status, AVID/Non-AVID	.963	.328	.0049
Gender, ethnicity, economic status, AVID/Non-AVID	.266	.607	.0014

Table 7 provides the descriptive statistics of mean developmental scale score gains for FCAT Mathematics for the main effects of AVID/non-AVID, ethnicity, gender, and economic status. The mean gain score for the non-AVID students was higher than the AVID students. Further, the non-White students had a higher mean gain score than the White students and male students had a higher mean gain score than female students. In terms of economic status, the non-economically disadvantaged students had a higher mean gain score than the economically disadvantaged students. A review of the standard deviations for each of the main effect variables reflected a high level of variability associated with each developmental mean gain score.

Table 7
FCAT Mathematics Developmental Scale Score Gains by AVID Participation, Ethnicity, Gender, and Economic Status (Means and Standard Deviations)

Independent Variables	*N*	*Mean Gains*	*SD*
AVID/Non-AVID			
AVID	100	88.8800	65.04735
Non-AVID	100	98.3500	59.97902
Ethnicity			
White	156	90.4744	62.98709
Non-White	44	104.7500	60.53679
Gender			
Male	86	99.5581	52.45292
Female	114	89.1316	69.14964
Economic Status			
Economically Disadvantaged	88	85.1818	67.11297
Non-Economically Disadvantaged	112	100.2411	58.23860

Table 8 provides the descriptive statistics of mean developmental scale score gains for FCAT Mathematics for the 2 x 2 interactions of the independent variables. In the interaction of gender and ethnicity, the non-White female students had the highest FCAT mathematics mean developmental scale score gain. Furthermore, the White female students demonstrated the lowest FCAT mathematics mean developmental scale score gain.

In the interaction of gender and economic status, the non-economically disadvantaged male students had the highest FCAT mathematics mean developmental scale score gain. The economically disadvantaged female students demonstrated the lowest mean gain score. For the effects of gender and AVID/non-AVID interactions, the male students who did not participate in the AVID program produced the highest mean developmental scale score gain while the female students who participated in the AVID program demonstrated the smallest mean gain.

For the interaction of ethnicity and economic status, the economically disadvantaged non-White students had the highest FCAT mathematics mean developmental scale score gain and the economically disadvantaged White students had the least mean developmental scale score gain. For the interaction of ethnicity and AVID/non-AVID variables, the non-White students who did not participate in the AVID program showed the greatest FCAT mathematics mean developmental scale score gain. Additionally, the White students who participated in the AVID program obtained the lowest mean score gain.

Finally, the interaction between economic status and AVID/non-AVID variables revealed that the non-economically disadvantaged students who participated in the AVID program had the highest mean developmental scale score gain and the economically disadvantaged AVID students had the least mean score gain. A review of the standard deviations for each of the 2 x 2 interactions reflected a high level of variability associated with each developmental mean gain score.

Table 8
Two-Factor Analysis of FCAT Mathematics Developmental Scale Score Gains by AVID Participation, Ethnicity, Gender, and Economic Status (Means and Standard Deviations)

Independent Variables and Interactions	*N*	*Mean Gains*	*SD*
Gender and Ethnicity			
Male, White	66	100.2576	56.53625
Male, Non-White	20	97.2500	36.96353
Female, White	90	83.3000	66.72355
Female, Non-White	24	111.0000	75.05360
Gender and Economic Status			
Male, Economically Disadvantaged	40	93.5750	46.33982
Male, Non-Economically Disadvantaged	46	104.7609	57.23953
Female, Economically Disadvantaged	48	78.1875	80.28504
Female, Non-Economically Disadvantaged	66	97.0909	59.15449
Gender and AVID/Non-AVID			
Male, AVID	43	95.0000	50.48149
Male, Non-AVID	43	104.1163	54.56373
Female, AVID	57	84.2632	74.28553
Female, Non-AVID	57	94.0000	63.89165
Ethnicity and Economic Status			
White, Economically Disadvantaged	48	67.6875	67.04307
White, Non-Economically Disadvantaged	108	100.6019	58.62026
Non-White, Economically Disadvantaged	40	106.1750	61.66239
Non-White, Non-Economically Disadvantaged	4	90.5000	52.91818
Ethnicity and AVID/Non-AVID			
White, AVID	78	87.3077	65.87637
White, Non-AVID	78	93.6410	60.21843
Non-White, AVID	22	94.4545	63.18961
Non-White, Non-AVID	22	115.0455	57.34895
Economic Status and AVID/Non-AVID			
Economically Disadvantaged, AVID	44	73.9318	73.54050
Economically Disadvantaged, Non-AVID	44	96.4318	58.70121
Non-Economically Disadvantaged, AVID	56	100.6250	55.39529
Non-Economically Disadvantaged,, Non-AVID	56	99.8571	61.45077

Table 9 depicts the descriptive statistics for the 2 x 2 x 2 interactions for the independent variables. For the interaction of gender, ethnicity, and economic status, the non-economically disadvantaged non-White female students had the highest FCAT mathematics mean developmental scale score gain. The economically disadvantaged White female students had the lowest mean scale score gain.

The interaction of gender, ethnicity, and AVID/non-AVID variables indicated that the non-White female students who did not participate in the AVID program had the highest FCAT mathematics mean developmental scale score gain and the White female students who participated in the AVID program had the lowest mean score gain. A review of the interaction effects of gender, economic status and AVID/non-AVID variables revealed that the non-economically disadvantaged male students who did not participate in the AVID program demonstrated the highest mean scale score gain. The economically disadvantaged female students who participated in the AVID program achieved the lowest mean scale score gain.

An examination of the interaction of ethnicity, economic status, and AVID/non-AVID variables revealed that the non-economically disadvantaged non-White students who did not participate in the AVID program achieved the highest mathematics mean developmental scale score gain. The economically disadvantaged White students who participated in the AVID program demonstrated the lowest mean scale score gain. A review of the standard deviations for each of the 2 x 2 x 2 interactions reflected a high level of variability associated with each developmental mean gain score.

Table 9

Three-Factor Analysis of FCAT Mathematics Developmental Scale Score Gains by AVID Participation, Ethnicity, Gender, and Economic Status (Means and Standard Deviations)

Independent Variables and Interactions	*N*	*Mean Gains*	*SD*
Gender, Ethnicity, and Economic Status			
Male, White, Economically Disadvantaged	22	87.1818	52.98035
Male, White, Non-Economically Disadvantaged	44	106.7955	57.70316
Male, Non-White, Economically Disadvantaged	18	101.3889	36.62551
Male, Non-White, Non-Economically Disadvantaged	2	60.0000	8.28528
Female, White, Economically Disadvantaged	26	51.1923	73.99298
Female, White, Non-Economically Disadvantaged	64	96.3437	59.31680
Female, Non-Economically Disadvantaged	22	110.0909	77.06949
Female, Non-Economically Disadvantaged	2	121.0000	67.88225
Gender, Ethnicity, and AVID/Non-AVID			
Male, White, AVID	33	94.5455	55.39579
Male, White, Non-AVID	33	105.9697	57.93611
Male, Non-White, AVID	10	96.5000	31.27743
Male, Non-White, Non-AVID	10	98.0000	43.64502
Female, White, AVID	45	82.0000	72.76394
Female, White, Non-AVID	45	84.6000	60.88678
Female, Non-White, AVID	12	92.7500	82.55590
Female, Non-White, Non-AVID	12	129.2500	65.08473
Gender, Economic Status, and AVID/Non-AVID			
Male, Economically Disadvantaged, AVID	20	86.7000	46.28413
Male, Economically Disadvantaged, Non-AVID	20	100.4500	46.54084
Male, Non-Economically Disadvantaged, AVID	23	102.2174	53.83219
Male, Non-Economically Disadvantaged, Non-AVID	23	107.3043	61.56477
Female, Economically Disadvantaged, AVID	24	63.2917	89.89679
Female, Economically Disadvantaged, Non-AVID	24	93.0833	68.02296
Female, Non-Economically Disadvantaged, AVID	33	99.5152	57.26098
Female, Non-Economically Disadvantaged, Non-AVID	33	94.6667	61.78120
Ethnicity, Economic Status, AVID/Non-AVID			
White, Economically Disadvantaged, AVID	24	54.2500	75.33591
White, Economically Disadvantaged, Non-AVID	24	81.1250	55.96996
White, Non-Economically Disadvantaged, AVID	54	102.0000	55.92043
White, Non-Economically Disadvantaged, Non-AVID	54	99.2037	61.69627
Non-White, Economically Disadvantaged, AVID	20	97.5500	65.51936
Non-White, Economically Disadvantaged, Non-AVID	20	114.8000	57.92427
Non-White, Non-Economically Disadvantaged, AVID	2	63.5000	13.43503
Non-White, Non-Economically Disadvantaged, Non-AVID	2	117.5000	72.83200

Table 10 displays the 2 x 2 x 2 x 2 interactions for the independent variables of gender, ethnicity, economic status, and AVID/non-AVID participation. The economically

disadvantaged non-White female students who did not participate in the AVID program had the highest FCAT mathematics mean developmental scale score gain. The economically disadvantaged White female students who participated in the AVID program had the lowest mean developmental scale score gain. The economically disadvantaged non-White male students who either did or did not participate in the AVID program had nearly identical FCAT mathematics mean developmental scale score gains. A review of the standard deviations for each of the 2 x 2 x 2 x 2 interactions reflected a high level of variability associated with each developmental mean gain score with the exception of the non-White economically disadvantaged male AVID student group who displayed relatively less variability.

Table 10
Four-Factor Analysis of FCAT Mathematics Developmental Scale Score Gains by AVID Participation, Ethnicity, Gender, and Economic Status (Means and Standard Deviations)

Independent Variables and Interactions	*N*	*Mean Gains*	*SD*
Gender, Ethnicity, Economic Status, AVID/Non-AVID			
Male, White, ED**, AVID	11	74.8182	55.18481
Male, White, ED, Non-AVID	11	99.5455	50.12856
Male, White, Non-ED, AVID	22	104.4091	54.03849
Male, White, Non-ED, Non-AVID	22	109.1818	62.33598
Male, Non-White, ED, AVID	9	101.2222	29.14952
Male, Non-White, ED, Non-AVID	9	101.5556	44.73005
Male, Non-White, Non-ED, AVID	1	*	*
Male, Non-White, Non-ED, Non-AVID	1	*	*
Female, White, ED, AVID	13	36.8462	87.31728
Female, White, ED, Non-AVID	13	65.5385	57.75756
Female, White, Non-ED, AVID	32	100.3438	57.97586
Female, White, Non-ED, Non-AVID	32	92.3438	61.28811
Female, Non-White, ED, AVID	11	94.5455	86.33929
Female, Non-White, ED, Non-AVID	11	125.6364	66.98697
Female, Non-White, Non-ED, AVID	1	*	*
Female, Non-White, Non-ED, Non-AVID	1	*	*

* Not reported to protect identity due to small sample size

**Economically Disadvantaged

Research Question 2

Research Question 2: To what extent is there a mean difference from eighth to tenth grade FCAT reading developmental scale score gains for students based on participation in AVID, and their ethnicity, gender, and economic status?

Exclusions Due to Failure to Match

There were some situations of failure to match where not all AVID students at each school could be matched with non-AVID students. The reasons for non-matching included (a) differences in tenth grade English course taken, (b) differences in ethnicity, and (c) differences in free and reduced lunch status. In these situations, the students who could not be matched were eliminated from the study.

Based on failure to match, School A had 15 of 36 AVID students eliminated, School B had 8 of 28 AVID students eliminated, School C had 5 of 15 AVID eliminated, School D had 11 of 17 AVID students eliminated, School E had 12 of 33 AVID students eliminated, and School F had 5 of 34 AVID students eliminated. In all cases AVID students were eliminated because they could not be matched with non-AVID students from the same school.

As shown in Table 11, a total of 214 students (107 AVID and 107 non-AVID) were used in the data analysis for Research Question 2. Participants included 86 (40%) males and 128 (60%) females. There were 166 (78%) White students and 48 (22%) non-White students. Additionally, there were 98 (46%) economically disadvantaged students and 116 (54%) non-economically disadvantaged students. In each case, equal numbers of AVID and non-AVID students were represented.

Table 11
Demographics of Participants for Reading (Frequencies and Percentages)

	AVID (*n* = 107)	Non-AVID (*n* = 107)
Gender		
Male	43 (40%)	43 (40%)
Female	64 (60%)	64 (60%)
Student race/ethnicity		
White	83 (78%)	83 (78%)
Non-White	24 (22%)	24 (22%)
Economic Status		
Economically Disadvantaged	49 (46%)	49 (46%)
Non-Economically Disadvantaged	58 (54%)	58 (54%)

Baseline Group Equivalence

Students were matched by gender, ethnicity, and economic status but were not evenly matched on eighth grade FCAT reading developmental scale score. For example, an AVID student from School A enrolled in English II honors, was a White female, with non-free/reduced lunch status and an eighth grade FCAT reading developmental scale score of 1715. This student was matched with a non-AVID student from the same school who was a White female with non-free/reduced lunch status enrolled in English II honors and an eighth grade FCAT reading developmental scale score of 1734. Thus, to determine group equivalence at baseline, i. e., eighth grade, an independent *t*-test was performed to determine if there was a difference in the eighth grade FCAT reading developmental scale score means between the AVID and the non-AVID students. The test was conducted using an alpha of .05. The null hypothesis was that there was no difference in the eighth grade FCAT reading developmental scale score means between the AVID students and non-AVID students.

The assumption of normality was tested and met for the distributional shape of the dependent variable for the AVID students. Review of the Shapiro-Wilk's test for normality (W = .994, p = .925), skewness (-.125) and kurtosis (-.066) statistics, and the Q-Q plot indicated that normality was a reasonable assumption for the AVID students. Although the boxplot indicated one case was a potential outlier, it was determined to be a legitimate value and thus was retained.

The assumption of normality was tested and met for the distributional shape of the dependent variable for the non-AVID students. Review of the Shapiro-Wilk's test for normality (W= .989, p = .510), skewness (-.053) and kurtosis (-.145) statistics, and the Q-Q plot indicated that normality was a reasonable assumption for the non-AVID students. The boxplot did not indicate any potential outliers.

Levene's test indicated that the assumption of homogeneity of variances was met (F = .626, p = .430). No significant difference existed (t (212) = -.501, p = .430) between the mean eighth grade FCAT reading developmental scale scores of AVID students (n = 107, M = 1936.055, SD = 132.858) and non-AVID students (n = 107, M = 1944.855, SD = 123.866). The 95% confidence interval for the difference between means was –43.419 to 25.811. The effect size was calculated by eta squared and found to be .00118 indicating that approximately .1% of the variance of eighth grade FCAT reading developmental scale score means could be accounted for by whether the student was an AVID student or a non-AVID student. Since the results of the independent t- test showed no significant difference in the eighth grade FCAT reading developmental scale score means between the AVID students and non-AVID students, the results suggest that the AVID and non-AVID students were evenly matched for Research Question 2.

Factorial ANOVA

A factorial ANOVA was performed to determine if there was a mean difference from eighth to tenth grade FCAT reading developmental scale score gains for students based on participation in AVID, and their ethnicity, gender, and economic status. The test was conducted using an alpha of .05. The null hypothesis was that there was no difference in reading developmental scale score gains, on average, between the AVID students and non-AVID students, and their ethnicity, gender, and economic status.

The assumptions of the test were reviewed, and not all were met by examining the unstandardized residuals. All indices suggested that normality was a reasonable assumption including skewness (-.450), kurtosis (.381), the histogram, Q-Q plots, and the Shapiro-Wilk's test of normality (D = .983, p = .013). Even though the Shapiro-Wilk's test was statistically significant, the other forms of evidence suggested normality. Given the sample size, the results should still be relatively robust to non-normality. Based on Levene's test of equality of variances, the assumption of homogeneity of variances was not met, F (15, 198) = 1.786, p = .039. However, the researcher proceeded with the analysis. A dot plot of unstandardized residual values by group was created to determine if there were patterns to the data that may suggest a violation of independence. Based on the dot plots, there were no observable trends and, therefore, independence was a reasonable assumption.

The results of the 2 x 2 x 2 x 2 factorial ANOVA suggested that there was not a statistically significant difference in the mean reading developmental scale score gains for students in AVID and students not in AVID or any interaction of gender, ethnicity, or economic status. However, there was a statistically significant difference in reading

developmental scale score gains, on average, for males (n = 86, M = 123.9535, SD = 146.19575) and females (n = 128, M = 67.8516, SD = 152.85870). These results are displayed in Table 12.

Table 12
Factorial Analysis of Variance of Mean Gain Scores for FCAT Reading

Variables	F (1, 198)	p	eta squared
AVID/Non-AVID	.299	.585	.0198
Gender	4.115	.044	.2720
Ethnicity	3.562	.061	.2354
Economic status	.008	.930	.0005064
Gender, ethnicity	.744	.390	.04915
Gender, economic status	.013	.909	.00086
Gender, AVID/Non-AVID	.892	.346	.05899
Ethnicity, economic status	.848	.358	.056073
Ethnicity, AVID/Non-AVID	.054	.816	.003578
Economic status, AVID/Non-AVID	.004	.948	.00028053
Gender, ethnicity, economic status	.022	.882	.0014478
Gender, ethnicity, AVID/Non-AVID	1.925	.167	.1237
Gender, economic status, AVID/Non-AVID	.792	.375	.05236
Ethnicity, economic status, AVID/Non-AVID	1.145	.286	.07566
Gender, ethnicity, economic status, AVID/Non-AVID	.705	.402	.0466025

Table 13 provides the descriptive statistics of mean developmental scale score gains for FCAT Reading for the main effects of AVID/non-AVID, ethnicity, gender, and economic status. The mean gain score for the AVID students was higher than the non-AVID students. Further, the White students had a higher mean gain score than the non-White students and male students had a higher mean gain score than female students. In terms of economic status, the non-economically disadvantaged students had a higher mean gain score than the economically disadvantaged students. A review of the standard deviations for each of the main effect variables reflected a high level of variability associated with each developmental mean gain score.

Table 13
FCAT Reading Developmental Scale Score Gains by AVID Participation, Ethnicity, Gender, and Economic Status (Means and Standard Deviations)

Independent Variables and Interactions	*N*	*Mean Gains*	*SD*
AVID/Non-AVID			
AVID	107	108.6075	154.85789
Non-AVID	107	72.1869	148.35978
Ethnicity			
White	166	102.7892	147.63308
Non-White	48	47.5417	162.17720
Gender			
Male	86	123.9535	146.19575
Female	128	67.8516	152.85870
Economic Status			
Economically Disadvantaged	98	66.5204	162.50902
Non-Economically Disadvantaged	116	110.5690	140.84578

Table 14 provides the descriptive statistics of mean developmental scale score gains for FCAT Reading for the 2 x 2 interactions of the independent variables. In the interaction of gender and ethnicity, the White male students had the highest FCAT reading mean developmental scale score gain. Furthermore, the non-White female students demonstrated the lowest FCAT reading mean developmental scale score gain and actually obtained a lower mean developmental scale score than they did on the eighth grade FCAT reading measure.

In the interaction of gender and economic status, the non-economically disadvantaged male students had the highest FCAT reading mean developmental scale score gain. The economically disadvantaged female students demonstrated the lowest mean gain score. For the effects of gender and AVID/non-AVID interactions, the male students who participated in the AVID program produced the highest mean developmental scale score gain while the female students who did not participate in the AVID program demonstrated the smallest mean gain.

For the interaction of ethnicity and economic status, the non-economically disadvantaged White students had the highest FCAT reading mean developmental scale score gain and the non-economically disadvantaged non-White students had the least mean developmental scale score gain. For the interaction of ethnicity and AVID/non-AVID variables, the White students who participated in the AVID program showed the greatest FCAT reading mean developmental scale score gain. Additionally, the non-White students who did not participate in the AVID program obtained the lowest mean score gain.

Finally, the interaction between economic status and AVID/non-AVID variables revealed that the non-economically disadvantaged students who participated in the AVID program had the highest mean developmental scale score gain and the economically disadvantaged students who did not participate in the AVID program had the least mean score gain. A review of the standard deviations for each of the 2 x 2 interactions reflected a high level of variability associated with each developmental mean gain score.

Table 14
Two-Factor Analysis of FCAT Reading Developmental Scale Score Gains by AVID Participation, Ethnicity, Gender, and Economic Status (Means and Standard Deviations)

Independent Variables and Interactions	*N*	*Mean Gains*	*SD*
Gender and Ethnicity			
Male, White	62	132.2419	133.58005
Male, Non-White	24	102.5417	176.06792
Female, White	104	85.2308	153.34315
Female, Non-White	24	-7.4583	128.19312
Gender and Economic Status			
Male, Economically Disadvantaged	36	109.5833	172.33114
Male, Non-Economically Disadvantaged	50	134.3000	124.90850
Female, Economically Disadvantaged	62	41.5161	152.39818
Female, Non-Economically Disadvantaged	66	92.5909	150.24708
Gender and AVID/Non-AVID			
Male, AVID	43	143.2558	137.47244
Male, Non-AVID	43	104.6512	153.60244
Female, AVID	64	85.3281	162.41902
Female, Non-AVID	64	50.3750	141.78135
Ethnicity and Economic Status			
White, Economically Disadvantaged	56	79.0536	159.24097
White, Non-Economically Disadvantaged	110	114.8727	140.57478
Non-White, Economically Disadvantaged	42	49.8095	167.22210
Non-White, Non-Economically Disadvantaged	6	31.6667	132.62529
Ethnicity and AVID/Non-AVID			
White, AVID	83	117.3855	150.59029
White, Non-AVID	83	88.1928	144.04204
Non-White, AVID	24	78.2500	168.61617
Non-White, Non-AVID	24	16.8333	152.79730
Economic Status and AVID/Non-AVID			
Economically Disadvantaged, AVID	49	73.9184	155.74403
Economically Disadvantaged, Non-AVID	49	59.1224	170.29565
Non-Economically Disadvantaged, AVID	58	137.9138	149.20318
Non-Economically Disadvantaged, Non-AVID	58	83.2241	127.43544

Table 15 depicts the descriptive statistics for the 2 x 2 x 2 interactions for the independent variables. For the interaction of gender, ethnicity, and economic status, the non-economically disadvantaged White male students had the highest FCAT reading mean developmental scale score gain. The non-economically disadvantaged non-White female students had the lowest mean scale score gain. Non-White female students,

regardless of economic status demonstrated a lower mean developmental scale score than they did on the eighth grade FCAT reading measure.

The interaction of gender, ethnicity, and AVID/non-AVID variables indicated that the non-White male students who participated in the AVID program had the highest FCAT reading mean developmental scale score gain and the non-White female students who did not participate in the AVID program had the lowest mean score gain. In fact the non-White female students who did not participate in the AVID program demonstrated a lower mean developmental scale score than they did on the eighth grade FCAT reading measure. A review of the interaction effects of gender, economic status and AVID/non-AVID variables revealed that the non-economically disadvantaged male students who participated in the AVID program demonstrated the highest mean scale score gain. The economically disadvantaged female students who did not participate in the AVID program achieved the lowest mean scale score gain.

An examination of the interaction of ethnicity, economic status, and AVID/non-AVID variables revealed that the non-economically disadvantaged White students who participated in the AVID program achieved the highest reading mean developmental scale score gain. The non-economically disadvantaged non-White students who did not participate in the AVID program demonstrated the lowest mean scale score gain. A review of the standard deviations for each of the 2 x 2 x 2 interactions reflected a high level of variability associated with each developmental mean gain score.

Table 15

Three-Factor Analysis of FCAT Reading Developmental Scale Score Gains by AVID Participation, Ethnicity, Gender, and Economic Status (Means and Standard Deviations)

Independent Variables and Interactions	*N*	*Mean Gains*	*SD*
Gender, Ethnicity, and Economic Status			
Male, White, Economically Disadvantaged	16	108.6875	162.66600
Male, White, Non-Economically Disadvantaged	46	140.4348	122.89049
Male, Non-White, Economically Disadvantaged	20	110.3000	183.89130
Male, Non-White, Non-Economically Disadvantaged	4	63.7500	145.22483
Female, White, Economically Disadvantaged	40	67.2000	158.36491
Female, White, Non-Economically Disadvantaged	64	96.5000	150.27615
Female, Non White, Economically Disadvantaged	22	-5.1818	131.70625
Female, Non White, Non-Economically Disadvantaged	2	-32.5000	111.01576
Gender, Ethnicity, and AVID/Non-AVID			
Male, White, AVID	31	140.3871	133.57761
Male, White, Non-AVID	31	124.0968	135.28473
Male, Non-White, AVID	12	150.6667	153.01238
Male, Non-White, Non-AVID	12	54.4167	190.66222
Female, White, AVID	52	103.6731	159.53864
Female, White, Non-AVID	52	66.7885	146.09295
Female, Non-White, AVID	12	5.8333	156.82117
Female, Non-White, Non-AVID	12	-20.7500	96.86366
Gender, Economic Status, and AVID/Non-AVID			
Male, Economically Disadvantaged, AVID	18	123.1661	133.09627
Male, Economically Disadvantaged, Non-AVID	18	96.0000	207.45517
Male, Non-Economically Disadvantaged, AVID	25	157.7200	141.43624
Male, Non-Economically Disadvantaged, Non-AVID	25	110.8800	103.47678
Female, Economically Disadvantaged, AVID	31	45.3226	162.70042
Female, Economically Disadvantaged, Non-AVID	31	37.7097	143.95559
Female, Non-Economically Disadvantaged, AVID	33	122.9091	155.27926
Female, Non-Economically Disadvantaged, Non-AVID	33	62.2727	140.87700
Ethnicity, Economic Status, AVID/Non-AVID			
White, Economically Disadvantaged, AVID	28	67.8929	143.29104
White, Economically Disadvantaged, Non-AVID	28	90.2143	175.68118
White, Non-Economically Disadvantaged, AVID	55	142.5818	149.17510
White, Non-Economically Disadvantaged, Non-AVID	55	87.1636	126.77244
Non-White, Economically Disadvantaged, AVID	21	81.9524	174.29185
Non-White, Economically Disadvantaged, Non-AVID	21	17.6667	157.40817
Non-White, Non-Economically Disadvantaged, AVID	3	52.3333	148.43629
Non-White, Non-Economically Disadvantaged, Non-AVID	3	11.0000	143.73239

Table 16 displays the 2 x 2 x 2 x 2 interactions for the independent variables of gender, ethnicity, economic status, and AVID/non-AVID participation. The non-

economically disadvantaged White male students who participated in the AVID program had the highest FCAT reading mean developmental scale score gain. The economically disadvantaged non-White female students who did not participate in the AVID program had the lowest mean developmental scale score gain. This group of students, along with the non-economically disadvantaged non-White male students who did not participate in the AVID program demonstrated a lower mean developmental scale score than they did on the eighth grade FCAT reading measure. A review of the standard deviations for each of the 2 x 2 x 2 x 2 interactions reflected a high level of variability associated with each developmental mean gain score.

Table 16
Four-Factor Analysis of FCAT Reading Developmental Scale Score Gains by AVID Participation, Ethnicity, Gender, and Economic Status (Means and Standard Deviations)

Independent Variables and Interactions	*N*	*Mean Gains*	*SD*
Gender, Ethnicity, Economic Status, AVID/Non-AVID			
Male, White, ED**, AVID	8	84.6250	62.02980
Male, White, ED, Non-AVID	8	132.7500	227.00079
Male, White, Non-ED, AVID	23	159.7826	146.91183
Male, White, Non-ED, Non-AVID	23	121.0870	92.32990
Male, Non-White, ED, AVID	10	154.0000	167.60536
Male, Non-White, ED, Non-AVID	10	66.6000	197.62096
Male, Non-White, Non-ED, AVID	2	134.0000	63.63961
Male, Non-White, Non-ED, Non-AVID	2	-6.5000	198.69701
Female, White, ED, AVID	20	61.2000	166.11714
Female, White, ED, Non-AVID	20	73.2000	154.29896
Female, White, Non-ED, AVID	32	130.2188	151.88594
Female, White, Non-ED, Non-AVID	32	62.7812	143.10040
Female, Non-White, ED, AVID	11	16.4545	159.88456
Female, Non-White, ED, Non-AVID	11	-26.8182	99.17038
Female, Non-White, Non-ED, AVID	1	*	*
Female, Non-White, Non-ED, Non-AVID	1	*	*

* Not reported to protect identity due to small sample size
**Economically Disadvantaged

Research Question 3

Research Question 3: To what extent is there a mean difference in tenth grade FCAT writing scores for students based on participation in AVID and their ethnicity, gender, and economic status?

Exclusions Due to Failure to Match

There were some situations of failure to match where not all AVID students at each school could be matched with non-AVID students. The reasons for non-matching included (a) differences in tenth grade English course taken, (b) differences in ethnicity, and (c) differences in free and reduced lunch status. In these situations, the students that could not be matched were eliminated from the study.

Based on failure to match, School A had 16 of 36 AVID students eliminated, School B had 15 of 28 AVID students eliminated, School C had 4 of 15 AVID students eliminated, School D had 12 of 17 AVID students eliminated, School E had 10 of 33 AVID eliminated from the study, and School F had 6 of 34 AVID students eliminated. In all cases, AVID students were eliminated because they could not be matched with non-AVID students from the same school.

As shown in Table 17, a total of 200 students (100 AVID and 100 non-AVID) were used in the data analysis for Research Question 3. Participants included 80 (40%) males and 120 (60%) females. There were 154 (77%) White students and 46 (23%) non-White students. Additionally, there were 90 (45%) students with free/reduced lunch status and 110 (55%) students with non-free/reduced lunch status. In each case, equal numbers of AVID and non-AVID students were represented.

Table 17
Demographics of Participants for Writing (Frequencies and Percentages)

	AVID (*n* = 100)	Non-AVID (*n* = 100)
Gender		
Male	40 (40%)	40 (40%)
Female	60 (60%)	60 (60%)
Student race/ethnicity		
White	77 (77%)	77 (77%)
Non-White	23 (23%)	23 (23%)
Economic status		
Economically Disadvantaged	45 (45%)	45 (45%)
Non-Economically Disadvantaged	55 (55%)	55 (55%)

Baseline Group Equivalence

Students were matched by gender, ethnicity, economic status, tenth grade English course, and eighth grade writing score. Therefore, no further analysis was needed to determine baseline equivalence.

Factorial ANOVA

A factorial ANOVA was conducted to determine if there was a mean difference in tenth grade FCAT writing scores for students based on participation in AVID, and their ethnicity, gender, and economic status. The test was conducted using an alpha of .05. The null hypothesis was that there was no mean difference in tenth grade writing scores between the AVID students and non-AVID students and their ethnicity, gender, and economic status.

The assumptions of the test were reviewed and met by examining the unstandardized residuals. All indices suggested that normality was a reasonable assumption including skewness (-.131), kurtosis (1.024), the histogram, Q-Q plots, and

the Shapiro-Wilk's test of normality (D = .982, p = .011). Even though the Shapiro-Wilk's test was statistically significant, the other forms of evidence suggested normality. Given the sample size, the results should still be relatively robust to non-normality (Lomax, 2007). Based on Levene's test of equality of variances, the variances were assumed to be homogeneous, F (15, 184) = 1.321, p = .193. A dot plot of unstandardized residual values by group was created to determine if there were patterns to the data that may suggest a violation of independence. Based on the dot plots, there were no observable trends and, therefore, independence was a reasonable assumption.

The results of the 2 x 2 x 2 x 2 factorial ANOVA suggested that there was a statistically significant difference in tenth-grade writing scores, on average, for students in AVID (n = 100 M = 4.025, SD = .7432) and students not in AVID (n = 100 M = 4.205, SD = .8230). Non-AVID students outperformed AVID students. However, there was no statistically significant difference in tenth-grade writing scores, on average, for gender, ethnicity, and economic status or for any interactions of gender, ethnicity, or economic status. These results are displayed in Table 18.

Table 18
Factorial Analysis of Variance of Tenth-Grade FCAT Writing Scores

Variables	*F* (1, 184)	*p*	eta squared
AVID/Non-AVID	5.520	.020	.2312
Gender	.293	.589	.0123
Ethnicity	1.334	.250	.0558
Economic status	.092	.762	.0038
Gender, ethnicity	2.767	.098	.1159
Gender, economic status	.494	.483	.0207
Gender, AVID/Non-AVID	1.887	.171	.07904
Ethnicity, economic status	.361	.549	.015076
Ethnicity, AVID/Non-AVID	3.342	.069	.13997
Economic status, AVID/Non-AVID	.290	.591	.01217
Gender, ethnicity, economic status	1.284	.259	.05373
Gender, ethnicity, AVID/Non-AVID	.338	.534	.01625
Gender, economic status, AVID/Non-AVID	1.269	.261	.05311
Ethnicity, economic status, AVID/Non-AVID	1.257	.264	.05262
Gender, ethnicity, economic status, AVID/Non-AVID	3.299	.071	.13817

Table 19 provides the descriptive statistics of tenth-grade mean writing scores for the main effects of AVID/non-AVID, ethnicity, gender, and economic status. The mean tenth- grade FCAT writing score of the non-AVID students who did not participate in AVID was higher than the AVID students. Further, the White students had a higher mean gain score than the non-White students and male students had a higher mean gain score than female students. In terms of economic status, the non-economically disadvantaged students had a higher mean gain score than the economically disadvantaged students.

Table 19
Tenth-Grade FCAT Writing Score Means and Standard Deviations by AVID Participation, Ethnicity, Gender, and Economic Status

Independent Variables and Interactions	*N*	*M*	*SD*
AVID/Non-AVID			
AVID	100	4.025	.7432
Non-AVID	100	4.205	.8230
Ethnicity			
White	154	4.166	.8004
Non-White	46	3.946	.7244
Gender			
Male	80	4.038	.8221
Female	120	3.946	.7624
Economic Status			
Economically Disadvantaged	90	4.000	.7344
Non-Economically Disadvantaged	110	4.209	.8194

Table 20 provides the descriptive statistics of tenth-grade mean writing scores for the 2 x 2 interactions of the independent variables. In the interaction of gender and ethnicity, the White female students had the highest mean writing score and the non-White female students had the lowest mean writing score.

In the interaction of gender and economic status, the non-economically disadvantaged female students had the highest tenth grade FCAT writing mean score and the economically disadvantaged male students demonstrated the lowest mean score. For the effects of gender and AVID/non-AVID interactions, the female students who did not participate in the AVID program produced the highest mean score while the male students who participated in the AVID program demonstrated the smallest mean score.

For the interaction of ethnicity and economic status, the non-economically disadvantaged White students had the highest FCAT writing mean score and the economically disadvantaged non-White students had the least mean scale score. For the interaction of ethnicity and AVID/non-AVID variables, the White students who did not

participate in AVID showed the greatest FCAT writing mean scale score. Additionally, the non-White students who participated AVID obtained the lowest mean score.

Table 20
Two-Factor Analysis of Tenth-Grade FCAT Writing Score Means and Standard Deviations by AVID Participation, Ethnicity, Gender, and Economic Status

Independent Variables and Interactions	*N*	*M*	*SD*
Gender and Ethnicity			
Male, White	60	4.033	.8629
Male, Non-White	20	4.050	.7052
Female, White	94	4.250	.7504
Female, Non-White	26	3.865	.7424
Gender and Economic Status			
Male, Economically Disadvantaged	30	3.967	.7063
Male, Non-Economically Disadvantaged	50	4.080	.8885
Female, Economically Disadvantaged	60	4.017	.7533
Female, Non-Economically Disadvantaged	60	4.317	.7477
Gender and AVID/Non-AVID			
Male, AVID	40	3.988	.6933
Male, Non-AVID	40	4.087	.9398
Female, AVID	60	4.050	.7795
Female, Non-AVID	60	4.283	.7328
Ethnicity and Economic Status			
White, Economically Disadvantaged	52	4.058	.7387
White, Non-Economically Disadvantaged	102	4.221	.8283
Non-White, Economically Disadvantaged	38	3.921	.7308
Non-White, Non-Economically Disadvantaged	8	4.062	.7289
Ethnicity and AVID/Non-AVID			
White, AVID	77	4.117	.7517
White, Non-AVID	77	4.214	.8485
Non-White, AVID	23	3.717	.6365
Non-White, Non-AVID	23	4.174	.7479
Economic Status and AVID/Non-AVID			
Economically Disadvantaged, AVID	45	3.822	.7474
Economically Disadvantaged, Non-AVID	45	4.178	.6839
Non-Economically Disadvantaged, AVID	55	4.191	.7038
Non-Economically Disadvantaged, Non-AVID	55	4.227	.9271

Finally, the interaction between economic status and AVID/non-AVID variables revealed that the non-economically disadvantaged students who did not participate in the AVID program had the highest mean score and the economically disadvantaged students who participated in the AVID program had the least mean score.

Table 21 depicts the descriptive statistics for the 2 x 2 x 2 interactions for the independent variables. For the interaction of gender, ethnicity, and economic status, the non-economically disadvantaged White female students had the highest tenth-grade FCAT writing mean score. The non-economically disadvantaged non-White female students had the lowest mean score.

The interaction of gender, ethnicity, and AVID/non-AVID variables indicated that the White female students who did not participate in the AVID program had the highest FCAT writing score and the non-White female students who participated in the AVID program had the lowest mean score. A review of the interaction effects of gender, economic status and AVID/non-AVID variables revealed that the non-economically disadvantaged female students who did not participate in the AVID program demonstrated the highest mean score. The economically disadvantaged female students who participated in the AVID program achieved the lowest mean score.

An examination of the interaction of ethnicity, economic status, and AVID/non-AVID variables revealed that the non-economically disadvantaged non-White students who did not participate in the AVID program achieved the highest writing score. The economically disadvantaged non-White students who participated in the AVID program demonstrated the lowest mean score.

Table 21

Three-Factor Analysis of Tenth Grade FCAT Writing Score Means and Standard Deviations by AVID Participation, Ethnicity, Gender, and Economic Status

Independent Variables and Interactions	*N*	*M*	*SD*
Gender, Ethnicity, and Economic Status			
Male, White, Economically Disadvantaged	16	3.969	.6447
Male, White, Non-Economically Disadvantaged	44	4.057	.9352
Male, Non-White, Economically Disadvantaged	14	3.964	.7958
Male, Non-White, Non-Economically Disadvantaged	6	4.250	.4183
Female, White, Economically Disadvantaged	36	4.097	.7821
Female, White, Non-Economically Disadvantaged	58	4.345	.7207
Female, Non-White, Economically Disadvantaged	24	3.896	.7068
Female, Non-White, Non-Economically Disadvantaged	2	3.500	1.4142
Gender, Ethnicity, and AVID/Non-AVID			
Male, White, AVID	30	4.050	.7468
Male, White, Non-AVID	30	4.017	.9781
Male, Non-White, AVID	10	3.800	.4830
Male, Non-White, Non-AVID	10	4.300	.8233
Female, White, AVID	47	4.160	.7598
Female, White, Non-AVID	47	4.340	.7380
Female, Non-White, AVID	13	3.654	.7468
Female, Non-White, Non-AVID	13	4.077	.7026
Gender, Economic Status, and AVID/Non-AVID			
Male, Economically Disadvantaged, AVID	15	3.833	.5563
Male, Economically Disadvantaged, Non-AVID	15	4.100	.8281
Male, Non-Economically Disadvantaged, AVID	25	4.080	.7594
Male, Non-Economically Disadvantaged, Non-AVID	25	4.080	1.0173
Female, Economically Disadvantaged, AVID	30	3.817	.8355
Female, Economically Disadvantaged, Non-AVID	30	4.217	.6114
Female, Non-Economically Disadvantaged, AVID	30	4.283	.6524
Female, Non-Economically Disadvantaged, Non-AVID	30	4.350	.8423
Ethnicity, Economic Status, AVID/Non-AVID			
White, Economically Disadvantaged, AVID	26	3.904	.8369
White, Economically Disadvantaged, Non-AVID	26	4.212	.6029
White, Non-Economically Disadvantaged, AVID	51	4.225	.6878
White, Non-Economically Disadvantaged, Non-AVID	51	4.216	.9553
Non-White, Economically Disadvantaged, AVID	19	3.711	.6082
Non-White, Economically Disadvantaged, Non-AVID	19	4.132	.7966
Non-White, Non-Economically Disadvantaged, AVID	4	3.750	.8660
Non-White, Non-Economically Disadvantaged, Non-AVID	4	4.375	.4787

Table 22 displays the 2 x 2 x 2 x 2 interactions for the independent variables of gender, ethnicity, economic status, and AVID/non-AVID participation. Non-economically disadvantaged White female students, regardless of whether they participate in AVID or not, had the highest mean writing scores. The non-White economically disadvantaged female students who participated in the AVID program had the lowest writing mean score.

Table 22
Four-Factor Analysis of FCAT Tenth-Grade FCAT Writing Score Means and Standard Deviations by AVID Participation, Ethnicity, Gender, and Economic Status

Independent Variables and Interactions	*N*	*M*	*SD*
Gender, Ethnicity, Economic Status, AVID/Non-AVID			
Male, White, ED**, AVID	8	4.000	.5976
Male, White, ED, Non-AVID	8	3.938	.7289
Male, White, Non-ED, AVID	22	4.068	.8062
Male, White, Non-ED, Non-AVID	22	4.045	1.0680
Male, Non-White, ED, AVID	7	3.643	.4756
Male, Non-White, ED, Non-AVID	7	4.286	.9512
Male, Non-White, Non-ED, AVID	3	4.167	.2887
Male, Non-White, Non-ED, Non-AVID	3	4.333	.5774
Female, White, ED, AVID	18	3.861	.9363
Female, White, ED, Non-AVID	18	4.332	.5145
Female, White, Non-ED, AVID	29	4.345	.5686
Female, White, Non-ED, Non-AVID	29	4.345	.8567
Female, Non-White, ED, AVID	12	3.750	.6908
Female, Non-White, ED, Non-AVID	12	4.042	.7217
Female, Non-White, Non-ED, AVID	1	*	*
Female, Non-White, Non-ED, Non-AVID	1	*	*

* Not reported to protect identity due to small sample size
**Economically Disadvantaged

Interview Findings

Arellanes et al. (2007) stated that in order to become a certified AVID site and use the AVID trade name, trademark, and logo, schools must adhere to the 11 AVID program essentials. In order to determine if the AVID program has been implemented with fidelity, the school's site team completes a self-study and assigns a rating to each of the 11 AVID essentials. According to the AVID Center (2006), schools that have implemented all 11 AVID Essentials at the certification standard level (a rating of at least a 1 for each essential on a scale of 0-3) are granted certification status. This ensures that the program has been implemented with fidelity. Guthrie and Guthrie (2002) confirmed that successful AVID programs are those programs that adhere to implementation of the 11 AVID essentials.

Each school in this study was a certified AVID site. The researcher conducted interviews with each school's AVID coordinator to verify that the AVID program was implemented with fidelity. All schools implemented the AVID program with fidelity based on the AVID 11 essentials questions. The common responses to each interview question can be found in Table 23.

Table 23
Interview Questions and Responses

Questions on AVID Essentials	Common Responses from All Schools
1. What criteria were used to select students?	GPA 2.0-3.5 FCAT scores Teacher recommendation Good behavior and attendance records Voluntary participation
2. What criteria were used to select teachers?	Selected by administration Voluntary participation Student advocate Good rapport with students Agreement to attend Summer Institute
3. What time of the school day was the AVID elective class offered?	Each period of the day
4. What English mathematics, science, and social studies classes were taken by AVID students?	At least one honors class Encouraged to take all honors or advanced placement classes
5. What type of reading and writing strategies were students instructed to use in the AVID program?	WICR strategies; Cornell notes, reflective journals; KWL; Frayer models
6. How often did the students participate in tutorials and Socratic seminars	Tutorial participation twice a week Socratic seminars approximately once a month
7. What modes of learning were students encouraged to utilize when working with others in AVID?	Collaboration Cooperative learning
8. How many tutors were available in the AVID classroom?	Three or more (attempted to meet 7:1 ratio)
9. How was the AVID Data System used to monitor student progress and AVID implementation?	Internal systems monitor student progress AVID Data System monitors implementation of 11 essentials; Self assessments
10. Did the AVID elective teacher attend the Summer Institute during 2007-2008 and 2008-2009?	Yes
11. Who are the AVID site team members?	Assistant Principal; AVID Coordinator; AVID elective teacher; guidance counselor; English, mathematics, science, social studies teachers (One school also included a foreign language teacher)
12. How often does the AVID site team meet and what is discussed?	Once a month; Topics discussed included: Student progress, recruitment and retention, field trips, site plan, certification status

Summary

This chapter presented the results of the data analysis for the three research questions. The findings were organized by each research question beginning with a description of the population used to answer each research question. The results suggested that there was not a statistically significant difference in FCAT mathematics developmental scale score gains for students in AVID and students not in AVID or any interaction of gender, ethnicity, or lunch status. Furthermore, the results also suggested there was not a statistically significant difference in FCAT reading developmental scale score gains for students in AVID and students not in AVID or any interaction of gender, ethnicity, or lunch status. However, there was a statistically significant difference in FCAT reading developmental scale score gains for the main effect of gender with males making higher gains, on average, than females.

Additionally, the results of this analysis suggested there was a statistically significant difference in tenth grade FCAT writing scores for students in AVID and students not in AVID with non-AVID students having higher scores, on average, than AVID students. However, there was no statistically significant difference in tenth grade FCAT writing scores for gender, ethnicity, and economic status or for any interactions.

The results of interviews conducted with AVID coordinators at each school site in this study revealed that all school sites were certified AVID sites and implemented the AVID program with fidelity. All sites adhered strictly to the 11 AVID essentials.

Chapter 5 contains a brief review of the purpose of the study, the population, the instrumentation and data analysis. This concluding chapter also contains a summary and discussion of the findings, implications for practice, and recommendations for future research.

CHAPTER 5
SUMMARY, DISCUSSIONS AND CONCLUSIONS

Introduction

The purpose of this study was to examine the relationship of student participation in AVID and student academic performance. More specifically, this study was conducted to determine if there was a mean difference in student performance on the Florida Comprehensive Assessment Test (FCAT) in mathematics, reading, and writing between AVID and non-AVID students during their first two years of high school. The AVID students were matched with students who were enrolled in the same tenth grade academic honors courses and had similar demographics (e.g., ethnicity, gender, and economic status) but did not participate in the AVID program. This chapter consists of an overview of the study, summary and discussion of the findings, implications for practice, recommendations for further research, and conclusions.

Overview of the Study

Population

The population for this study consisted of students from six high schools with certified AVID programs during the 2007-2008 and 2008-2009 school years that were located in two central Florida school districts. A comparison of FCAT performance of AVID students and non-AVID students who had similar demographics (e.g. ethnicity, gender, and socioeconomics status) was made. Students participating in the AVID program were matched with non-AVID participants from the same school for each school

site by ethnicity, gender, socioeconomic status, and tenth grade mathematics course (for Research Question 1) or tenth grade English course (for Research Questions 2 and 3).

Data Collection and Analysis

The researcher transferred all collected data from Excel spreadsheets to SPSS (version 16.0). A total of 200 students (100 AVID and 100 non-AVID) were used in the data analysis for Research Question 1. Participants included 86 (43%) males and 114 (57%) females. There were 156 (78%) White students and 44 (22%) non-White students. Additionally, there were 88 (44%) students with free/reduced lunch status and 112 (56%) students with non-free/reduced lunch status.

For Research Question 2, a total of 214 students (107 AVID and 107 non-AVID) were used in the data analysis. Participants included 86 (40%) males and 128 (60%) females. There were 166 (78%) White students and 48 (22%) non-White students. Additionally, there were 98 (46%) students with free/reduced lunch status and 116 (54%) students with non-free/reduced lunch status.

A total of 200 students (100 AVID and 100 non-AVID) were used in the data analysis for Research Question 3. Participants included 80 (40%) males and 120 (60%) females. There were 154 (77%) White students and 46 (23%) non-White students. Additionally, there were 90 (45%) students with free/reduced lunch status and 110 (55%) students with non-free/reduced lunch status. For each research question and for each case, equal numbers of AVID and non-AVID students were represented. In addition to gathering student data, the researcher interviewed the AVID coordinator at each school by phone to determine how each of the 11 AVID essentials was implemented at the school sites to verify if the AVID program was implemented with fidelity. The following

section provides a summary and discussion of the findings for each of the three research questions.

Discussion of the Findings

Research Question 1

To what extent is there a mean difference from eighth to tenth grade FCAT mathematics developmental scale score gains for students based on participation in AVID, and their ethnicity, gender, and economic status?

For Research Question 1, there were no statistically significant mean differences in FCAT mathematics based on participation in AVID, ethnicity, gender, and economic status. Additionally, there were no statistically significant mean differences in mathematics based on any two-, three-, or four-way interactions of these variables. While descriptively the AVID group performed marginally better than did the non-AVID group for the non-economically disadvantaged participants, this finding was not statistically significant. Small effect sizes (Green & Salkind, 2008) were indicated for AVID/non-AVID and interactions of (1) gender and ethnicity; and (2) ethnicity and economic status variables. The effect sizes of the remaining interactions were trivial (less than 1%).

The AVID group performed marginally better than did the non-AVID group for the non-economically disadvantaged participants. However, none of the mean differences in mathematics developmental scale score gains were statistically significant between the AVID and non-AVID groups. This finding was consistent with the results of a study conducted by Rorie (2007) in which there was no significant difference between AVID and non-AVID students on the mathematics component of the Colorado Student

Assessment Program. Rorie also reported a small effect size for the AVID/non-AVID participation factor.

Although Bali and Alvarez (2004) specified that the race gap in achievement test scores in American education is an important issue, the results of this study did not reflect any significant differences in mean FCAT mathematics developmental gain scores based upon ethnicity. Furthermore, in terms of mathematics achievement based on gender, the results of this study are consistent with other empirical studies that indicated little achievement differences between males and females (Else-Quest, Hyde, & Linn, 2010; Husain & Millimet, 2009; Ma, 2008; Marks, 2008). Else-Quest et al. conducted a meta-analysis of the 2003 Trends in International Mathematics and Science Study (TIMSS) and the Programme for International Student Assessment (PISA) to determine the extent to which gender differences existed in mathematics. The findings supported that, on average, there were very little mathematics achievement differences between males and females. However, it was noted that males had more positive attitudes toward mathematics than females. While some studies revealed that students who met the free and reduced lunch criteria had lower academic achievement compared with their non-free and reduced lunch counterparts (Caldas & Bankston III, 1997; Frederickson & Petrides, 2008; Okpala, Okpala, & Smith, 2001), the results of this study found no significant difference in mean mathematics developmental gain scores and a small effect based on this indicator of economic status.

Additionally, these findings support the literature on detracking as a means to closing the achievement gap (Burris & Welner, 2005; Burris, Wiley, Welner, & Murphy, 2008; Goodlad & Oakes, 1988). The AVID students' mathematics performance was not

statistically significantly different than their matched non-AVID peers; students enrolled in regular honors classes. In other words, AVID and non-AVID students were performing similarly. Since AVID students are typically students who would have remained in a general curriculum if it were not for the AVID program, it appears that no significant difference in gain scores between AVID students and non-AVID students may indicate that the AVID program was actually beneficial in enhancing student performance. The lack of a statistically significant difference in mean developmental gain scores may indicate that the average level students who were selected for the AVID program performed in a similar manner to the honors students due to their involvement in a more advanced curriculum coupled with their participation in the AVID elective course. However, it could not be determined if this outcome was the result of participation in the AVID program or the result of simply having access to a more rigorous academic curriculum (Gamoran, 1992, Mehan, Hubbard, Lintz, & Villanueva, 1994) or both.

Research Question 2

To what extent is there a mean difference from eighth to tenth grade FCAT reading developmental scale score gains for students based on participation in AVID, and their ethnicity, gender, economic status?

For Research Question 2, there were no statistically significant mean differences in FCAT reading based on participation in AVID, ethnicity, and economic status. Additionally, there were no statistically significant mean differences in reading based on any two-, three-, or four-way interactions of these variables. While descriptively the AVID group had greater FCAT reading developmental mean score gains than did the non-AVID group across the variables of ethnicity, gender, economic status, and the two-,

three-, or four-way interactions of these variables, these finding were not statistically significant.

Examination of the effect size suggested small effect sizes for AVID/non-AVID and interactions of (1) gender and ethnicity; (2) gender, economic status, and AVID/non-AVID; and (3) gender, ethnicity, economic status and AVID/non-AVID. Medium effect sizes were noted for interactions of (1) gender and AVID/non-AVID; (2) ethnicity and economic status; (3) gender, ethnicity, and AVID/non-AVID; and (4) ethnicity, economic status, and AVID/non-AVID factors. Large effect sizes were found in the main effects of gender and ethnicity.

The results of this study indicated a statistically significant difference in reading developmental scale score mean gains for gender with males making higher gains than females regardless of their participation in the AVID program. While the findings of other researchers have indicated that females outperform males in reading (Chiu & McBride-Chang, 2006; Lietz, 2006; Ma, 2008; Marks, 2008), the findings in this study indicated that males had higher reading developmental scale score gains than females. However, this study does not provide evidence of differences in overall reading achievement levels based upon gender. Males did not necessarily perform better in reading than females, but had greater gains, indicating that AVID was a positive influence in reading. Studies conducted by Chiu and McBride-Change, and Marks examined the reading performance of 15-year-olds in many different countries using data from the Organization for Economic Cooperation and Development's Program for International Student Assessment (OECD-PISA). The findings in these studies indicated

that a gender gap does exist with females outperforming males in reading in every country.

As the gains in reading achievement by the AVID students were not differentiated statistically by ethnicity, it could be hypothesized that the increased level of peer support and school attachment (LeCroy & Krysik, 2008) provided by the AVID elective class served to positively impact the non-White AVID students in this study. This is promising as research conducted by Kao and Thompson (2003) indicated White students outperform non-White students in grades and on standardized tests.

Research Question 3

To what extent is there a mean difference in tenth grade FCAT writing scores for students based on participation in AVID, and their ethnicity, gender, and economic status?

For Research Question 3 there was a statistically significant difference in tenth grade FCAT writing scores with non-AVID participants outperforming AVID participants. It is important to note that the group mean scores of the AVID and non-AVID students both approximate the writing achievement level score of 4, indicating similar levels of overall group performance on this instrument. Large effect sizes were found for the main effect of AVID/non-AVID as well as the four-way interaction of gender, ethnicity, economic status and AVID/non-AVID. Moderate effect sizes were found for the main effect of ethnicity as well as the interaction of gender and AVID/non-AVID. Small effect sizes were found for the remaining interactions. A trivial effect was found for the main effect of economic status.

The results of this study are inconsistent with the findings of Rorie (2007) who found no significant difference between AVID and non-AVID students on the eleventh

grade writing assessment of the Colorado Student Assessment Program. Furthermore, Rorie indicated a small effect size for the main effect of AVID/non-AVID factors where a large effect was found in this study.

While descriptively males outperformed females, White students outperformed non-White students, and non-economically disadvantaged outperformed economically disadvantaged, these findings were not statistically significant. This finding was inconsistent with other studies that indicated females outperform males and White students outperform Black students in writing performance (Engelhard, Walker, Gordon, & Gabrielson, 1994; Gabrielson, Gordon & Engelhard, 1995).

Engelhard et al. (1994) studied the writing performance of eighth grade students on the Georgia statewide assessment of writing and noted the differences between the performance of males and females and the differences in performance between Black students and White students. They reported a significant difference in performance by gender with females rating higher than males. The effect size for topic development was .30 and for conventions was .41. Additionally, they reported that White students had significantly higher scores than Black students. The effect size for topic development was .57 and for conventions was .68 (Engelhard et al.).

Limitations

A limitation of this study involved a failure to match all AVID students with non-AVID students as initially intended. The reasons for non-matching included (a) differences in tenth grade mathematics course taken, (b) differences in ethnicity, and (c) differences in economic status. In these situations, the students who could not be matched were eliminated from the study, thus decreasing the sample size.

An additional limitation of this investigation was the lack of a comparison group of average students who were not selected for participation in AVID nor were enrolled in honors classes. This group could serve more as a true control group and a comparison of the mean gain scores between this average group of students, the AVID group, and the non-AVID group could have provided an additional basis for determining the efficacy of the AVID program.

Though the selection process for the AVID program requires an examination of factors related to student attendance (Arellanes et al., 2007), the potential impact of student absenteeism on program integrity was not investigated in this study. Attendance, particularly for the AVID students, is an essential factor, as excessive absenteeism would have a two-fold effect of less exposure to the more advanced curriculum, and less support via the AVID elective class.

Another limitation is that this study did not account for variation in student performance by specific school site. It is possible that certain factors that are specific to each school (e.g., class size, teacher characteristics, environmental factors) may represent confounding variables.

Teachers who were trained in AVID strategies imparted instruction to both AVID and non-AVID students. This element of the AVID program could serve as a confounding variable as both groups of students could have benefitted from this program effect.

A final limitation relates to issues involving the large variability of student performance on the mathematics and reading components of the FCAT for the AVID and non-AVID groups. The variability produced rather large standard deviations in many of

the statistical comparisons and consequently required a much larger mean difference to produce statistically significant findings (Lomax, 2007). It is probable that the inclusion of several of the outliers was responsible for this result.

Implications for Practice

The results of this investigation suggest that one method of increasing academic rigor is to place students in more advanced courses and provide them with necessary support. This impression is consistent with the conclusions of Burris and Welner (2005) who advocated that equal access to higher level curriculum can enhance the achievement of all students. Since the mean gain scores of the AVID students were statistically indistinguishable from the honors level students in the areas of mathematics and reading, this suggests that the AVID program may be providing the necessary components to facilitate the academic development of "students in the middle," although causality cannot be determined given the design of the study.

Historically, much attention has been devoted to meeting the needs of academically advanced students (Kulik & Kulik, 1982), as well as low achieving students (Smith-Maddox & Wheelock, 1995). The AVID program, however, specifically was designed to address the needs of students in the middle described by Swanson (2005) as "the silent majority" (p. 31). Consequently, this study supports the work of Mehan et al. (1994), Oswald (2001), and Watt, Powell, Mendiola, and Cossio, (2006) who maintained that the AVID program can provide students with a skill set and academic experiences that will enable future success.

School leaders were faced with increasing levels of accountability for student achievement. Florida's Department of Education assigned grades to schools based on a

variety of criteria (FLDOE, 2010). Increased participation of students in dual enrollment classes and Advanced Placement (AP) courses coupled with their successful performance on the AP exams was one criteria that could result in a higher school grade. Consequently, the implementation of the AVID program may result in a greater percentage of students enrolling in advanced courses.

This study lends additional support to those researchers who have advocated detracking as a method for closing the achievement gap between high and low achieving students (Burris et al., 2009; Burris & Garrity, 2008; Burris & Welner, 2005; Goodlad & Oakes, 1988; Oakes & Lipton, 1992; Slavin, 1995). Nelson (2007) maintained that students who are provided access to a more advanced curriculum can achieve at higher rates than if they remained in remedial or general courses. As the AVID students in this study were involved with honors level coursework and performed at academic levels that were statistically indistinguishable from the non-AVID honors students, Nelson's contention is supported in the areas of reading and mathematics.

Recommendations for Future Research

Based on the results of this study, a number of recommendations for future research are offered.

1. Florida Department of Education has developed End of Course (EOC) assessments as outcome measures for student performance in a variety of mathematics courses. Consequently, future research efforts should include these measures in efficacy studies involving the AVID program.
2. Since the EOC assessments have been scheduled to include the additional academic area of science (FLDOE, 2010), it may be useful to determine

whether the AVID program is beneficial in this content area by utilizing science EOC assessments as outcome measures.

3. Future research activities could explore the impact of the AVID program on SAT and ACT scores. Moreover, a qualitative investigation that explores the attributes of AVID program students who were high performers on the ACT and SAT could be useful in determining specific AVID program factors that contributed to their success.
4. A longitudinal study of AVID and non-AVID students would assist in understanding if there were differential performance of these students in postsecondary environments.
5. Additional research to evaluate the effects of the AVID elective class on student outcomes could be helpful in determining the impact of this specific component on overall program effectiveness.
6. This study was not a multi-level analysis. All schools were examined in aggregate. Future research should be conducted that examines the impact of individual school level variation on the efficacy of the AVID program.
7. The replication of this current study with the inclusion of a comparison group of average students who do not participate in AVID or honors classes could be helpful in determining whether the AVID program promotes significant gains in achievement relative to average students who are educated in the general curriculum.
8. Finally, there may be additional value to the AVID program that cannot be measured solely by achievement test outcomes. The AVID program is worthy

of further study via a comprehensive program evaluation process to discern any collateral benefits that are imparted to students.

Summary and Conclusions

During times when resources for education are scarce, educational leaders must make decisions regarding implementation of programs that will have the greatest impact on student achievement. Because programs can be relatively expensive, leaders are charged with the task of determining what programs are effective in improving student achievement and worthy of investment of resources.

The AVID program requires considerable financial and human resources. Assistant Director of Marketing and Communications at the AVID Center Headquarters reported that AVID can cost a district nearly $30,000 for one school site for one school year (S. Baratte, personal communication, July 24, 2009). This cost includes a membership fee, curriculum materials, staff development, summer institute trainings, and a professional service fee for support and training. Therefore, the problem addressed in this study was to determine the extent to which student participation in the AVID program related to student achievement in mathematics, reading, and writing as measured by the Florida Comprehensive Assessment Test (FCAT) in selected central Florida high schools.

This study revealed that AVID students, who were typically students who would have remained in the general curriculum if it were not for the AVID program (Swanson, 2005), appeared to perform as well as the regular honors students on the mathematics and reading FCAT. The only statistically significant difference in performance was found in tenth grade writing scores with non-AVID students outperforming AVID students.

The WICR (writing, inquiry, collaborative, reading) strategies are the primary instructional methodologies utilized by the AVID program. These instructional methodologies are well supported in the literature for producing positive academic (Balgopal & Wallace, 2009; Drabick, Weisberg, Paul & Bubier, 2007; Johnson, Johnson, & Taylor, 2001; King, 1990; Lord & Orkwiszewsi, 2006) and social benefits (Johnson et al., 2001; Johnson & Johnson, 1999; Slavin & Cooper, 1999). Although the AVID program represents considerable expense for school systems, the components of teacher training and AVID program integrity could generalize across instructional settings and support student achievement. As school system accountability becomes more stringent at the federal, state, and local levels, stakeholders will require more empirical evidence regarding the positive effects of any instructional program. Whereas this study contributed to the impact of the effects of the AVID program on student performance as measured by the FCAT, future investigations are necessary to provide a more robust understanding of the efficacy of this instructional program.

APPENDIX A
INSTITUTIONAL REVIEW BOARD OUTCOME LETTER

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

NOT HUMAN RESEARCH DETERMINATION

From : **UCF Institutional Review Board #1**
FWA00000351, IRB00001138

To : **Linda Connors**

Date : **October 02, 2009**

Dear Researcher:

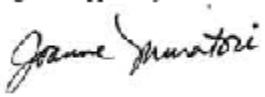
On 10/2/2009 the IRB determined that the following proposed activity is not human research as defined by DHHS regulations at 45 CFR 46 or FDA regulations at 21 CFR 50/56:

Type of Review:	Not Human Research Determination
Project Title:	A Comparison of 2007-2009 Achievement for Advancement Via Individual Determination (AVID) Students and Non-AVID Students in Select Central Florida High Schools
Investigator:	Linda Connors
IRB ID:	SBE-09-06451
Funding Agency:	
Grant Title:	
Research ID:	N/A

University of Central Florida IRB review and approval is not required. This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are to be made and there are questions about whether these activities are research involving human subjects, please contact the IRB office to discuss the proposed changes.

On behalf of the IRB Chair, Joseph Bielitzki, DVM, this letter is signed by:

Signature applied by Joanne Muratori on 10/02/2009 02:26:37 PM EDT



IRB Coordinator

APPENDIX B
DATA COLLECTION FORM

DATA COLLECTION FORM

Stdt	Gnd	Eth	Econ	LEP	Mx	Thm	8R DSS	8M DSS	8W	9R DSS	9M DSS	10R DSS	10M DSS	10W	10Wgpa	10Ugpa	10Eng	10Mth	10Sci	10SS

APPENDIX C
INTERVIEW QUESTIONS FOR AVID COORDINATOR

Interview Questions Regarding Implementation of AVID Essentials

1. What criteria were used to select students for participation in the AVID program during the 2007-2008 school year?
2. How were AVID teachers selected?
3. During what time in the school day was the AVID elective class offered during 2007-2008 and 2008-2009 school years?
4. What English, mathematics, science, and social studies courses were taken by AVID students in 2008-2009?
5. What type of reading and writing strategies were students instructed to use in the AVID program during 2007-2008 and 2008-2009?
6. How often did AVID students participate in tutorials and socratic seminars in 2007-2008 and 2008-2009?
7. What modes of learning were students encouraged to utilize when working with others in the AVID program during 2007-2008 and 2008-2009?
8. How many tutors were available in the AVID classroom during 2007-2008 and 2008-2009 and how were they selected?
9. How was the AVID Data System used to monitor student progress and AVID program implementation during 2007-2008 and 2008-2009?
10. Did the teacher who taught the AVID elective class in 2007-2008 and 2008-2009 attend the AVID Summer Institute both years?
11. Describe the make up of participants on the AVID site team in 2007-2008 and 2008-2009. I do not want the names but just titles for example: mathematics teacher, guidance counselor, administrator, etc.
12. How often did the AVID site team meet in 2007-2008 and 2008-2009 and what was discussed?

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