

THE DIFFERENCE IN ACT COLLEGE READINESS BENCHMARKS BETWEEN AVID
STUDENTS AND NON-AVID STUDENTS

by

Stephany Eisenmenger Eley

Liberty University

A Dissertation Presented in Partial Fulfillment

Of the Requirements for the Degree

Doctor of Education

Liberty University

November 10, 2014

THE DIFFERENCE IN ACT COLLEGE READINESS BENCHMARKS BETWEEN AVID
STUDENTS AND NON-AVID STUDENTS

by Stephany Eisenmenger Eley

A Dissertation Presented in Partial Fulfillment
Of the Requirements for the Degree
Doctor of Education

Liberty University, Lynchburg, VA

November, 2014

APPROVED BY:

Dr. Vivian O. Jones, Ph.D., Committee Chair

Dr. Shawntrice Thomas, Ed.D., Committee Member

Dr. Janet Kemerait, Ed.D. , Committee Member

Scott B. Watson, Ph.D., Associate Dean of Advanced Programs

ABSTRACT

This quantitative study examined the difference in college readiness (as measured by the ACT College Readiness Benchmarks) between high school students who were enrolled in AVID (Advancement Via Individual Determination) for three or more years and students who were never enrolled in AVID. A causal comparative research design was employed to compare high school students from a Central Florida school district containing both AVID high schools and non-AVID high schools. AVID students were demographically matched to non-AVID students for race, gender, socio-economic status (as measured by free and reduced lunch status), Title 1 status, and grade level. Independent t tests were used to analyze the data because the two levels of the independent variable contain different test subjects. The independent t tests showed statistically significant differences between the AVID participants and their non-AVID counterparts for all three of the *ACT College Readiness Benchmark* scores (ACT Composite, ACT English and ACT Math). The results of this study supported the extension of the AVID program to all students within the target school district and the target state to increase college readiness and not just the underserved minority students currently enrolled in the program.

Descriptors: College Readiness, Autonomy, AVID (Achievement Via Individual Determination).

Dedication

This dedication is offered in acknowledgement of the validation and guidance given by my friend and mentor, Martha Sinclair. Martha and her late husband Jack encouraged and supported me as I began my graduate studies at Liberty University to persevere and complete the doctoral program. Martha served as editor and sounding board for countless research papers and early drafts of my dissertation. This document is dedicated to her.

Acknowledgements

To complete a task as rigorous and challenging as researching and writing a doctoral dissertation requires the assistance of many individuals. I gratefully acknowledge the support and facilitation of the following individuals.

To my husband and children who sacrificed countless meals and family activities when I needed to meet academic deadlines. I appreciate their support and indulgence as I pursued this goal. A special acknowledgment must be made to my son, Joel, for his technical assistance and expertise. This document could not have been completed without his persistent help for which I am extremely grateful.

To my dissertation committee and especially my dissertation chair, Dr. Vivian Jones; Dr. Jones helped me circumvent many initial obstacles, provided direction and feedback, and invaluable statistical guidance and support. Dr. Shawntrice Thomas and Dr. Janet Kemerait provided insightful suggestions and encouragement throughout the dissertation process. I am indebted and thankful to Dr. Kemerait for her editorial review of my document.

To Dr. Amanda Rockinson-Szapkiw who demanded excellence, elicited my highest efforts, and continually sent me back to the literature. I appreciate the rigor she instilled in this process.

To Brevard Public Schools who provided access to student data and assisted me in navigating the technical aspects of the student data program. I especially wish to acknowledge Ms. Janet Stephenson and Mr. Bob McLaren without their assistance this project would not have been possible.

Table of Contents

| | |
|--|----|
| ABSTRACT..... | 3 |
| Dedication..... | 4 |
| Acknowledgements..... | 5 |
| List of Tables | 8 |
| CHAPTER ONE: INTRODUCTION..... | 9 |
| Introduction..... | 9 |
| Background..... | 11 |
| Problem Statement..... | 14 |
| Purpose Statement..... | 15 |
| Significance of the Study..... | 15 |
| Research Question(s) | 17 |
| Hypotheses..... | 17 |
| Identification of Variables | 18 |
| Definitions | 19 |
| Research Summary | 20 |
| CHAPTER TWO: REVIEW OF THE LITERATURE..... | 22 |
| Theoretical Framework..... | 22 |
| Review of the Literature | 24 |
| Summary..... | 51 |
| CHAPTER THREE: METHODOLOGY | 53 |
| Introduction..... | 53 |
| Hypotheses..... | 54 |

| | |
|---|-----|
| Participants..... | 55 |
| Setting..... | 59 |
| Instrumentation..... | 61 |
| Procedures..... | 63 |
| Research Design..... | 65 |
| Data Analysis..... | 67 |
| CHAPTER FOUR: FINDINGS..... | 69 |
| Introduction..... | 69 |
| Descriptive Statistics..... | 70 |
| Results..... | 75 |
| Additional Analysis..... | 76 |
| CHAPTER FIVE: DISCUSSION..... | 78 |
| Introduction..... | 78 |
| Summary of the Findings..... | 78 |
| Discussion of the Findings..... | 79 |
| Study Limitations..... | 84 |
| Implications of the Research..... | 86 |
| Theoretical Implications of the Research..... | 89 |
| Recommendations for Future Research..... | 89 |
| Conclusion..... | 91 |
| REFERENCES..... | 93 |
| APPENDIX A..... | 101 |
| APPENDIX B..... | 103 |

List of Tables

| | |
|---|-----|
| Table 1 Shapiro-Wilk's Analysis of Data..... | 71 |
| Table 2 Levene's Test for Equality of Variances Data..... | 73 |
| Table 3 Independent <i>t</i> Test Analysis | 75 |
| Table 4 Mann Whitney U Test | 77 |
| Table 5 11 th Grade AVID and Non-AVID Matching Data..... | 101 |
| Table 6 12 th Grade AVID and Non-AVID Matching Data..... | 103 |

CHAPTER ONE: INTRODUCTION

Introduction

Three decades ago, in 1983, participants at the National Commission on Excellence in Education, identified a decline in high school academic standards and began the push to strengthen high school graduation requirements (Gewertz, 2011). The American Diploma Project was launched in 2002 by a consortium of stakeholders to attempt to close what they identified as the “the college readiness gap,” the discrepancy between college eligibility and college readiness (Haycock, 2010). This disconnect continues to exist as the statistics from the most recent reporting of ACT scores show that only 25 % of high school students who took the test in 2011 met all four of the college readiness benchmarks (Gewertz, 2011).

In response to this national dilemma, states across the nation are looking for programs to help close the college readiness gap (Pettit & Prince, 2010). It is possible that many states have a program already being implemented in their school districts that could provide the solution to their quest.

AVID (Advancement Via Individual Determination) was begun in 1980 by Mary Catherine Swanson in an attempt to increase the college enrollment of underserved minority students in her California school district (Swanson, 1989). Swanson offered these students “rigor with support” and the success of her program was nothing short of amazing. Ninety-eight percent of the first six AVID graduating classes (178 out of 181 students) went on to attend colleges or universities. Not only did they attend, but also they were successful. AVID graduates attending San Diego State University achieved a significantly higher freshman grade point average than the total freshman class average (2.46 to 1.9). Swanson reported that those

attending the University of California at San Diego achieved only a slightly lower grade point average than the entire freshman class (2.47 to 2.83).

AVID employs strategies that correspond with factors determined by Deci and Ryan (2000) in their Self-Determination Theory to increase motivation, competence, autonomy, and relatedness in students. Research by Deci and Ryan supports the concept that successful use of these strategies could promote self-integration for AVID participants. Self-Determination Theory describes how the interaction of external motivating factors (i.e. grades, opinions of others, rewards) and internal motivating factors (i.e. curiosity, interests, a desire to succeed) impact motivation (Deci & Ryan, 2000). Deci and Ryan determined that conditions that fostered competence, autonomy, and relatedness increased intrinsic motivation and extrinsic motivation that leads to self-integration. Self-integration is necessary for students to have the motivation and desire to persevere through the rigors of the college experience. The principles of Self-Determination Theory are at the heart of college readiness and the AVID program may provide the solution to closing the college readiness gap for all high school students not just the underserved minority population.

An extensive number of research studies have been done examining AVID's effectiveness for increasing college enrollment and retention but there have been no studies to date examining AVID's impact on college readiness. The purpose of this research study will be to compare the college readiness of students enrolled in the AVID program for three or more years with the college readiness of students who have never been enrolled in the AVID program.

This causal comparative study will compare the ACT College Readiness Benchmark scores of students enrolled in the AVID program for three or more years with the ACT College Readiness Benchmark scores of students never enrolled in the AVID program. The results of

this study could provide data to support the extension of the AVID program to all students within the target school district and throughout the target state and not just the underserved minority students currently benefiting from the program.

Background

In response to a growing lack of college preparedness by incoming freshman students, the Bill and Melinda Gates Foundation initiated research by Dr. David L. Conley in 2007 to develop a model for college readiness (Conley, 2008a). Conley's research organization, the Educational Policy Improvement Center (EPIC) conducted extensive validity and reliability studies of his four college readiness dimensions: "(1) key cognitive strategies, (2) key content knowledge, (3) academic behaviors, and (4) contextual knowledge" (Conley, 2010, p. 3). In addition to content knowledge, these dimensions include non-academic support behaviors such as time management, study skills, note taking strategies, and knowledge about the college admission and financial aid process (Conley, 2010).

In the four years that elapsed from 2007, the number of students taking the ACT test rose from 130 million to 162 million (Gewertz, 2011). This increase included dramatic increases in minority student participation with a 116 % increase in Hispanic students, 59 % increase in Asian students, and a 47 % increase in African American students (Gewertz, 2011). Despite record participation, the indications of college readiness did not significantly increase over the four year period. The percentage of students meeting the *ACT College Readiness Benchmarks* in all four areas, English, mathematics, reading, and science rose from 23 % in 2007 to 25 % in 2011. The alarming news is that in 2011, "Three-quarters of U.S. students fell short of the ACT's definition of being prepared for a university education in all four subjects" (Gewertz, 2011, p. 8).

Statistics from the 2011 Beginning College Survey of Student Engagement (BCSSE) reported the following survey results for elements included in Conley's dimension of Academic Behaviors. Out of the more than 70,000 freshman students responding to the survey, 83 % reported spending 15 hours or less a week while in high school studying, doing, homework, etcetera; 63 % reported that they did not take a class for college credit while in high school; and 65 % reported that while in high school they worked only seldom or never with classmates on academic endeavors outside of class. Kuh (2007) summarizes the problem: "findings suggest that many high school seniors are not prepared academically for college-level work and have not developed the habits of the mind and heart that will stand them in good stead to successfully grapple with more challenging intellectual tasks" (p. 5).

The theory used in this research was Self-Determination Theory developed by Deci and Ryan (2000). Self-Determination Theory was designed to explain how the interaction of extrinsic motivating factors and intrinsic motivating factors affect motivation. The theory states that conditions that foster competence, autonomy, and relatedness increase intrinsic motivation and internalization of extrinsic motivation that lead to self-integration. In this study to determine the difference in college readiness of AVID students verses non-AVID students, this theory supports the hypothesis that students who participated in the AVID program for three or more years will have higher college readiness scores than those who never participated in the program. Because AVID strategies promote competence, autonomy, and relatedness in its participants, AVID students should have greater motivation for the educational endeavors that are necessary to create college readiness.

The tenets of self-determination theory (Deci & Ryan, 2000) support successful preparation for and assimilation into a college environment. Deci and Ryan (2000) proposed

three support structures that encourage intrinsic motivation and internalization of external motivation: autonomy, competence, and relatedness. Research has identified intrinsic motivation when linked to high levels of autonomy as the most significant predictor of successful academic performance (Soric, 2009). In a study of over two hundred college students, researchers determined that self-efficacy for learning had the greatest effect on course grades (Kitsantas & Zimmerman, 2009). Kitsantas and Zimmerman (2009) further reported that, “Research has established that self-regulatory processes, such as goal setting, self-monitoring, and self-evaluating, are highly predictive of students’ achievement track in school” (p. 98). These research findings indicate that potential for success in college coursework, in other words college readiness, could be influenced by programs able to increase student autonomy, competence, and relatedness.

Components of the AVID program were designed to develop all three intrinsic motivators; autonomy, competence, and relatedness. AVID was developed by Mary Catherine Swanson in 1980 to increase the enrollment of underrepresented minority and economically disadvantaged students into area colleges and universities (Swanson, 1989). AVID students are required to enroll in rigorous college preparatory coursework and to participate in an AVID elective class designed to improve reading and writing competences, test-taking and study skills, and to develop note-taking and assignment tracking systems (Watt, Johnson, Huerta, Mendiola, & Alkan, 2008). The AVID elective teacher functions as a mentor, coach, and surrogate parent. One of the AVID elective teachers interviewed by Watt et al. (2008) made the following observation, “AVID provides students with a familial environment that often enables them to pursue endeavors they might not otherwise attempt” (p. 73). The research indicates that the AVID program increases student motivation for academic endeavors by increasing the

competence, autonomy, and relatedness of its participants (Watt et al., 2008). While the AVID program was not developed in response to a lack of college preparedness by high school graduates, the tenets of the program were designed to develop college readiness in its participants.

An extensive number of research studies have been done examining AVID's effectiveness for increasing college enrollment and retention but there have been no studies examining AVID's impact on college readiness (Black, Little, McCoach, Purcell, & Seigle, 2008; Mendiola, Watt, & Huerta, 2010; Mendiola, Watt, Huerta, & Lozano, 2007; Watt, Huerta, & Alkan, 2011; Watt, Huerta, & Lozano, 2009; Watt, Johnson, Huerta, Mendiola, & Alkan, 2008). The purpose of this research study was to compare the college readiness of students enrolled in the AVID program for three or more years with students who were never enrolled in the AVID program.

Problem Statement

The problem is that only 19 % of the 2014 Florida high school graduates were able to meet the *ACT College Readiness Benchmarks* in all four subject areas, English, reading, mathematics, and science (The ACT Profile Report, 2014). Forty-one percent of the Class of 2014 was not able to meet any of the four benchmarks. While the national percentage for the graduating class of 2014 showed only twenty-six percent of the students able to meet all four benchmarks, Florida's graduates were significantly lower in college readiness capabilities in every one of the four subject areas (The ACT Profile Report, 2014).

Florida's ACT statistics demonstrate the nationwide trend of students graduating from high school with the necessary requirements for college admission but lacking the skills to successfully complete college coursework (Gewertz, 2011). Students' feelings of autonomy and

belongingness are significant components of academic achievement and motivation (Guay, Ratelle, & Chanal, 2008) which are able to impact the acquisition of the four dimensions of college readiness identified by Conley (2010), particularly academic behaviors and key content knowledge. Students who do not possess sufficient autonomy may have difficulty meeting the rigors of a college educational environment (Yen & Liu, 2009). Schools and school districts have been looking for programs that can increase college readiness capabilities in their students (Dougherty, 2010) and this study may show that AVID has that ability.

Purpose Statement

The purpose of this causal comparative study was to examine the tenets of the theory of self-determination as they apply to the AVID program (Deci & Ryan, 2000) by comparing Central Florida high school students enrolled in the AVID program and Central Florida high school students never enrolled in the AVID program for college readiness as measured by *ACT College Readiness Benchmark* scores. The independent variable was defined as students enrolled in a college readiness system that is designed to increase student-wide learning and performance (AVID, n.d.). The dependent variable was generally defined as *ACT's College Readiness Benchmarks*, the minimum ACT test scores required for students to have a high probability of success in credit bearing college courses (The ACT, n.d.). The control variable of student demographics including race, gender, socio-economic status (as measured by free and reduced lunch status), Title 1 status, and grade level was controlled by matching AVID participants to non-AVID participants for these dimensions.

Significance of the Study

The movement to improve the college readiness abilities of the nation's high school graduates began at the 2005 National Education Summit on High Schools. On the final day of

the summit, The American Diploma Project was launched to “make the high school diploma synonymous with college and work readiness” (Achieve, n.d.).

Florida is one of 35 states currently participating in the American Diploma Project and has made a commitment to graduating students who have the skills to be successful in college coursework (Achieve, n.d.). While 35 states participate in the American Diploma Project, no research was found that evaluates the impact of their efforts on the college readiness of their students. One report and two articles do appear in the literature describing the college readiness efforts of California (Spence, 2009), Washington State (Pettit & Prince, 2010), and New Mexico (New Mexico Public Education Department, 2010). These publications merely describe the efforts being undertaken by each state and the characteristics of the initiatives they are utilizing.

Florida has not identified or developed a statewide program to assist in raising the college readiness of its high school graduates. In 2014, 35 of Florida’s school districts, particularly its larger school districts, have incorporated the AVID program in their middle schools, high schools, or both (Florida Department of Education, n.d.). The schools currently implementing AVID have teachers trained to use AVID strategies. If a statistically significant difference in college readiness is shown to exist between students enrolled in AVID and students never enrolled in AVID, then Florida schools and school districts may choose to extend AVID strategies to a larger population of students beyond students who are currently benefiting from the program.

Rather than investing in a new statewide initiative to increase college readiness, AVID may provide the solution to the college readiness dilemma for Florida students. Throughout the country, other states which are already invested in the AVID program for their underserved minority and economically disadvantaged students, may also decide to extend the program

components to a wider population of their students.

Research Question(s)

RQ1: Will there be a difference in college readiness (as measured by the *ACT College Readiness Benchmarks*) between high school students enrolled in the AVID program for three or more years and high school students who have never been enrolled in the AVID program?

RQ2: Will there be a difference in college readiness for English between high school students enrolled in the AVID program for three or more years and high school students who have never been enrolled in the AVID program?

RQ3: Will there be a difference in college readiness for mathematics between high school students enrolled in the AVID program for three or more years and high school students who have never been enrolled in the AVID program?

Hypotheses

Null Hypothesis **H₀₁**: There will be no statistically significant difference in college readiness, as measured by the *ACT College Readiness Benchmarks*, between high school students enrolled in the AVID program for three or more years and high school students never enrolled in the AVID program.

Null Hypothesis **H₀₂**: There will be no statistically significant difference in college readiness for English, as measured by the *ACT College English Benchmark*, between high school students enrolled in the AVID program for three or more years and high school students never enrolled in the AVID program.

Null Hypothesis **H₀₃**: There will be no statistically significant difference in college readiness for mathematics, as measured by the *ACT College Mathematics*

Benchmark, between high school students enrolled in the AVID program for three or more years and high school students never enrolled in the AVID program.

Identification of Variables

Independent Variables

The independent variables were students enrolled in the AVID program for three or more years and students never enrolled in the AVID program from a school district in Central Florida. The independent variable was defined as students enrolled in a college readiness system that is designed to increase student-wide learning and performance (AVID, n.d.).

Dependent Variables

The dependent variables were college readiness (as measured by the *ACT College Readiness Benchmarks* specifically ACT Composite scores, ACT English scores, and ACT Math scores). College Readiness is operationally defined as the *ACT College Readiness Benchmarks* (The ACT, 2011). “These benchmarks (ACT English = 18, ACT Mathematics = 22, ACT Reading = 21, and ACT Science = 24) reflect a 50 % chance of a B or higher grade or a 75 % chance of a C or higher grade in entry-level, credit-bearing college English Composition, College Algebra, Social Sciences, and Biology courses” (The ACT, 2011).

Control Variable

The control variable of student demographics included the following dimensions: race, gender, socio-economic status (as measured by free and reduced lunch status), Title 1 status, and grade-level. Extraneous variables such as those mentioned above (race, gender, etc.) can influence the conclusions of a causal comparative study (Gall, Gall, & Borg, 2010). For the last five years, disaggregated data on *ACT College Readiness Benchmarks* scores nationwide show a clear disparity between the benchmark scores of minority students and their white counterparts

(The ACT, n.d.). Similar research demonstrates disparity in college performance and graduation rates between male and female students despite higher entrance rates for the male students (DiPrete & Buchman, 2006; Ewert, 2012). Moore et al. (2009) concluded, based upon their review of ten research studies exploring the effects of poverty on children, that poverty “has large and consistent associations with negative academic outcomes” (p. 4). Research conducted by Arslan (2013) examining the differences in perceptions of self-efficacy between students at various grade levels determined that a student’s grade level significantly influenced his/her perception of self-efficacy. Self-efficacy is at the basis of Self-Determination Theory (Deci & Ryan, 2000) which forms the theoretical framework for AVID’s program components. Grade level differences, therefore, become a critical variable when examining student performance. If these extraneous variables were not controlled, the results of this research study could be confounded. For this reason, AVID participants were matched to non-AVID participants for race, gender, Title 1 status, and socio-economic status (Gall, Gall, & Borg, 2010).

Gall, Gall, and Borg (2010) make the following recommendation, “Matching is used to equate two groups on one or more extraneous variables so that these extraneous variables do not confound the study of causal relationships involving the variables of primary interest to the researcher” (p. 313). Therefore, the demographics of race, gender, Title 1 status, socio-economic status, and grade-level were controlled by matching each AVID participant with a non-AVID counterpart from the target school district.

Definitions

Advancement Via Individual Determination (AVID): A college readiness program targeting underserved students which provides academic and social support designed to increase student learning and performance (AVID, n.d.).

Autonomy: Feeling that one's actions and goals are self-chosen and emanate from one's true self rather than from coercion or outside forces (Weinstock, 2009).

Belongingness or relatedness: The feeling of being accepted and supported by others, particularly a designated group of others (Ryzin, Gravely, & Roseth, 2009).

Competence: This is more general than self-efficacy and refers to an individual's belief in his/her ability to successfully achieve in a specific domain (Bortoli, Bertollo, Comani, & Robazzo, 2011).

Intrinsic motivation: Participation in an activity because it is spontaneously satisfying and interesting in itself (Deci & Ryan, 2000).

Extrinsic motivation: Participation in an activity because it leads to some separate consequence. In most instances, because it will lead to a reward or in order to avoid a punishment (Deci & Ryan, 2000).

Self-efficacy: An individual's belief in his/her capability to effectively learn or perform a task (Kitsantas & Zimmerman, 2009).

Self-regulation: The ability of an individual to be active and responsible for his/her own learning process (Kitsantas & Zimmerman, 2009).

Research Summary

The research design for this project does not involve the manipulation of the independent variable but instead relies upon previously existing groups (students enrolled in the AVID program and students never enrolled in the AVID program). Students self-select to participate in the AVID program; consequently, it would be impossible to randomly assign students into a test group and a control group for experimental purposes. Because students cannot be randomly assigned into the AVID program, the elements necessary for an experimental or quasi-

experimental design are not present and so a causal comparative design was chosen (Gall, Gall, & Borg, 2010).

The research design is quantitative relying on one quantitative measure-- the *ACT College Readiness Benchmarks*. The study determined if a difference existed for students who have been enrolled in the AVID program for three or more years and between students who have never been enrolled in the AVID program for the dependent variable college readiness.

Student participants were selected from a Central Florida school district that has AVID high schools and non-AVID high schools. The non-AVID participants were selected from a non-AVID high school to eliminate the possibility of the AVID Effect (Watt, Huerta, & Lozano, 2007). AVID students were matched to non-AVID students for race, gender, socio-economic status (as measured by free and reduced lunch status), grade level, and un-weighted grade point average in order to strengthen the validity of the results.

Participant scores for the *ACT College Readiness Benchmarks* were requested from the Central Florida school district records and matched to each student by number to protect anonymity. Student demographic data was also requested from the district for race, gender, socio-economic status, Title 1 status, and grade level.

CHAPTER TWO: REVIEW OF THE LITERATURE

Theoretical Framework

David Conley has been addressing the disconnect between the requirements for successful graduation from high school and matriculation to college and the ability to successfully complete college level coursework for close to a decade. He has become one of the leading experts on the lack of college readiness by American high school graduates. Conley (2010) in conjunction with the University of Oregon's Center for Educational Policy Research has developed a college readiness model based upon discussions with college faculty and an evaluation of college course contents (Conley, 2010). Conley's Four Dimensions of College and Career Readiness include: Key Cognitive Strategies, Key Content Knowledge, Academic Behaviors, and Contextual Skills and Awareness.

Conley's components of college readiness require student motivation, student achievement, and successful assimilation into the college community. Deci and Ryan's Self-Determination Theory (2000) explains the factors that assist students in acquiring the mental, emotional, and social skills necessary for successful academic performance at the collegiate level.

Deci and Ryan make the following statement about their research theory:

The initial idea was that the type or quality of a person's motivation would be more important than the total amount of motivation for predicting many important outcomes such as psychological health and well-being, effective performance, creative problem-solving, and deep or conceptual learning. (p. 1)

The outcomes delineated by Deci and Ryan are some of the key components of Conley's college readiness model such as effective performance, creative problem-solving abilities, and deep

conceptual learning. These align directly with Conley's Key Cognitive Strategies and Key Content Knowledge. The additional components of psychological health and well-being will have a profound effect on Conley's component of Academic Behaviors.

Thus, understanding the factors that influence self-determination may provide insight into ways schools and school districts can increase the college readiness of their students. Ryan and Deci (2008) make the distinction between autonomous motivation and controlled motivation in their research. Autonomous motivation can be intrinsic to the individual (i.e. self-motivation) but also includes extrinsic motivation that creates a perceived value to the individual and this can lead to self-internalization. Controlled motivation is not internalized by the individual but is rather an avoidance of negative consequences or the anticipation of positive rewards (Ryan & Deci, 2008).

Self-Determination Theory postulates that autonomous motivation leads to greater persistence, increased performance, and enhanced psychological health rather than controlled motivation. Deci and Ryan (2000) identified three components necessary for psychological well-being: the need for competence, autonomy, and relatedness. A number of studies cited by the authors substantiate that intrinsic goals foster greater psychological well-being and increased performance rather than extrinsic goals. Deci and Ryan determined that conditions that foster competence and autonomy increased intrinsic motivation, whereas, conditions which controlled behavior and undermined perception of competence thwarted development of intrinsic motivation.

The authors identify the implications for educational institutions and for parents:

Knowledge concerning the nutrients essential for positive motivation and experience and, in turn, for enhanced performance and well-being has broad significance. It is

relevant to parents and educators concerned with cognitive and personality development because it speaks to the conditions that promote both the assimilation of information and behavioral regulations. (p. 76)

Self-Determination Theory speculates that if school and school districts desire to increase college readiness in their students, they should incorporate strategies that will develop competence, autonomy, and relatedness in their students.

Research by Ryzin, Gravely, and Roseth (2009) support Deci and Ryan's (2000) conclusion that autonomous motivation leads to student engagement and thus to academic achievement. They make the following conclusions regarding how school efforts can influence academic performance:

Our findings document mechanisms by which secondary schools can, both directly and indirectly, contribute to positive student adjustment. Schools cannot only provide more academic autonomy and strive to create more supportive teacher-student relationships, but also can foster greater peer-related belongingness through the implementation of reforms aimed at improving peer relations. This can be seen as an intriguing opportunity for schools, given that hope has been linked to superior academic achievement. (p. 10)

Research results by Guay, Ratelle, and Chanal (2008) support this conviction as they determined that, "the more students endorse autonomous forms of motivation, the higher their grades are, the more they persist, the better they learn, and the more they are satisfied and experience positive emotions at school" (p. 237).

Review of the Literature

The State of College Readiness

The call for strengthening academic standards and increasing academic rigor began almost 20 years ago at the National Commission on Excellence in Education. Educators, business leaders, and elected officials all recognized a growing trend of high school graduates ill prepared to meet the challenges of college level coursework. Representatives from colleges and universities throughout the nation expressed the growing need for remedial instruction in English and/or mathematics for incoming freshmen students (Haycock, 2010).

Since the commission meeting in 1983, numerous articles have been written about the alarming statistics on the college readiness of American high school students and the initiatives created in an attempt to rectify the situation. These articles are not research based; instead they present an intellectual argument identifying the problem and sometimes presenting potential solutions.

Achieve (2011) presented the historical perspective:

By 2004, states were becoming increasingly aware that their high schools, which had changed very little since the mid-20th century, were not producing the 21st century graduates needed to compete and succeed after high school in an increasingly complex and interconnected world. (p. 7)

In 2004, Achieve interviewed college faculty members and employers and discovered that a significant discrepancy existed between the skills students had acquired during high school and those needed to be successful in college and post-graduate employment. Achieve labeled this discrepancy the “expectation gap” and called on educational leaders to implement strategies to reduce the default between high school graduation requirements and the capabilities for college success.

At the forefront of the college readiness movement was the American Diploma Project formed in 2002 by educators from five states and representatives from four national organizations: Achieve, Education Trust, the Fordham Foundation, and the National Alliance of Business. These educational and community leaders recognized the default between successful academic performance in high school and a successful transition to college academic requirements. The goal of this consortium was to support collaboration efforts between secondary and college leaders to develop strategies for closing the achievement gap between high school and college (Haycock, 2007).

This initiative was born out of a realization that while college enrollment was on the rise, at the same time, students requiring remedial coursework were reaching epidemic proportions (Conley, 2007). In 2007, Cline, Bissell, Hafner, and Katz reported that one-third of all California high school graduates were admitted into the state university system but 50 percent of this elite group required remediation in English, mathematics, or both. As a result of these dismal statistics, representatives from California State University, the California Department of Education, and the State Board of Education collaborated to develop California's Early Assessment Program (EAP) (Cline et al., 2007). The program contained three components: accountability testing for all students after completing 11th grade, professional development courses for high school teachers, and expanded curriculum options for high school juniors and seniors (Cline et al., 2007).

Additional data cited as an indicator of college readiness potential comes from the High School Survey of Student Engagement (HSSE) conducted annually by the Indiana University Center for Postsecondary Research. Kuh (2007) analyzed data from the HSSE and concluded that:

Taken together, HSSE findings suggest that many high school seniors are not prepared academically for college-level work and have not developed the habits of the mind and heart that will stand them in good stead to grapple with more challenging intellectual tasks. (p. 5)

The HSSE does not purport to be academic research and participation in the survey is voluntary which affects the validity of the results. While Kuh (2007) reported selected results of the HSSE and provided an analysis of the data, the survey results were not reported in table form and no statistical analysis of the data was provided.

The year 2007 appeared to be a capstone year for examining college readiness in high school graduates. The 21st Century Consortium, a group of United States school superintendents from seven school districts around the nation was formed in 2007. A recent article by Skully and Lawrence (2011) reported on the findings of members of the consortium who had interviewed representatives from public and private universities, colleges, and community colleges in their respective states. The college representatives were asked to describe the academic credentials and experiences of freshman students entering their institutions. This article was not based on scientific research but simply reported the observations and opinions of a number of college and university leaders. Skully and Lawrence reported that presumably because freshman entering community colleges “tend to have weaker academic histories” (p. 5) they also exhibited the highest levels of remedial enrollment. College leaders also identified a lack of rigorous academic preparation in their freshman students particularly in the area of technical writing and communication skills. Interestingly, the administrators from private colleges and universities expressed no concerns about the academic preparation of their college freshman but they were concerned about their emotional preparation for the rigors of college life. They specifically cited

an inability of incoming freshman to cope with failure particularly in the area of not meeting their parent's expectations (Skully & Lawrence, 2011). While college readiness usually focuses on the academic preparation of high school graduates, a lack of emotional readiness can also have a profound effect on successful college performance.

For almost a decade, David Conley has been recognized as a leading expert on the college readiness crisis. In 2003, he published articles under the auspices of the University of Oregon's Center for Educational Policy Research documenting the disconnect between successful completion of high school and a successful transition into college. Conley cited statistics from many of the participants in the America Diploma Project including Achieve, The Educational Trust, and the Thomas Fordham Foundation, as well as, the National Center for Education Statistics, and the National Survey of Student Engagement (NSSE) to make his case for a growing lack of college readiness by incoming college freshmen (Conley, 2003, 2008a).

In his two 2008 articles, both entitled *Rethinking College Readiness*, Conley (2008a) identified four key components of college readiness: "key cognitive strategies, key content knowledge, academic behaviors, and contextual skills and knowledge" (p. 1). These articles outline the constructs of Conley's college readiness model and provide a logical and intellectual rationale for each of the four components. The components are based in part from data collected from the observations of college professors but cite little scientific research to substantiate Conley's proposal.

In April of 2010, Conley et al. published the results of research conducted at 38 high schools throughout the nation to validate his CollegeCareerReady Diagnostic Tool. The schools in this study were selected for inclusion based upon a history of preparing students who were

successful college freshmen. The results of the study were presented at the annual conference of the American Educational Research Association in Denver, Colorado (Conley et al., 2010).

Through an examination of the characteristics of high schools that successfully prepare students for college, Conley et al. (2010) identified seven principles that helped schools prepare students for successful college attrition:

- Principle 1: Creating and maintaining a college-going culture in the school
- Principle 2: Creating a core academic program that is aligned with and leads to college readiness by the end of 12th grade
- Principle 3: Teach self-management skills and academic behaviors and expect students to use them
- Principle 4: Make college and careers real by helping students manage the complexity of preparing for and applying for post secondary education
- Principle 5: Create assignments and grading policies that more closely approximate college expectations each successive year of high school
- Principle 6: Make the senior year meaningful and appropriately challenging
- Principle 7: Build partnerships with and connections to postsecondary programs and institutions.

The goal of this study was to validate an instrument designed to determine the effectiveness of high schools in preparing their graduates for the rigors of college.

As part of the American Diploma Project Network, Achieve publishes an annual progress report on the status of all fifty states in their college readiness efforts. The 2011 report indicated that all but three states have adopted the Common Core Standards (CCS) (Achieve, 2011). This represents a significant paradigm shift for the nation as curriculum standards have

been the bastion of each individual state and the range of requirements were widely different between states. The push for Common Core Standards aligns with David Conley's College Readiness Principle 2: Creating a core academic program that leads to college readiness by the end of 12th grade (Conley et al., 2010). Closely aligned with common core standards are graduation requirements. Achieve reported for 2011 that only 20 states had established graduation requirements that are aligned with college and career readiness (Florida is one of the 20).

Recent publications verify that a lack of college readiness in college freshmen still exists despite efforts to address the problem over the last decade (Gewertz, 2011). ACT College Readiness Benchmark scores reported by ACT, Inc. in 2007 showed that 23 % of all the students tested met the benchmarks for all four subject areas; English, mathematics, reading and science, which were included on the test. The reported scores for 2011, the most recent scores available, showed only a slight improvement from 2004 with 25 % of all students tested meeting the benchmarks in all four subject areas of the test (Gewertz, 2011). Citing evidence from ACT's "Mind the Gaps" study, Gewertz (2010) explains the importance of meeting these benchmarks:

Taking a strong core curriculum in high school and meeting benchmark scores in all four subjects of the ACT college entrance exam enhance students' chances of enrolling in college, persisting there for a second year, earning good grades, and obtaining a two-year or four-year degree... This is particularly true for students from low-income families and for what ACT defined as 'underrepresented minority students'—African Americans, Latinos, and Native Americans. (p.1)

In the last thirty years, the number of high school students indicating a desire to attend college has more than doubled with 40 % documented in 1980 and 80 % in 2002 (Roderick,

Nagaoka, & Coca, 2009). Minority aspirations for college enrollment are confirmed by the increased number of minority students taking the ACT. The number of students taking the ACT rose by over half a million students since 2004 and a significant portion of that increase came from minority students. African American student participation increased by almost 50 % and Hispanic student participation increased by over 100 % in the last five years (Gewertz, 2011).

The dramatic increase in college aspirations falls across all ethnic and racial groups but the college graduation statistics for minority and low income students have not kept pace with expectations. Only 10.5 % of Latino students graduated with a Bachelor's degree and less than 20 % of African American students (17.8 %) completed a 4 year degree program. These rates are only slightly higher than in 1990 (Roderick et al., 2009).

Roderick, Nagaoka, and Coca (2009) examined the "aspirations-attainment gap" for low-income, minority students and recommended policies to help close the gap. According to the researchers, the key to closing the gap is adequate preparation or "college readiness", "...the central strategy to improve college access and performance must be to ensure that students leave high school with academic skills, coursework, and qualifications they need (Roderick et al., 2009, p. 188). Researchers listed the same four areas of college readiness identified by David Conley, content knowledge, basic academic skills, non-cognitive skills, and college knowledge. The first three areas were assessed by examining student grade point averages, achievement test scores, and college entrance exam scores. Researchers cited the following statistics of minority college readiness based on this criteria, "Less than one-quarter (23 percent) of African American and only 20 percent of Latino graduates would be deemed college-ready compared with 40 percent of whites" (Roderick et al., 2009, p. 193). The authors further identified that while enrollment in college preparatory and college-level courses has increased, minority achievement

has remained flat. “In mathematics, half (49 percent) of whites but only one-quarter of Latinos and 12 percent of African Americans met the (ACT College Readiness) benchmarks” (p. 193). Roderick et al. make the case that high school GPA is an indicator of non-cognitive college readiness ability. “High school grades emerged as the strongest predictor of college GPA and college graduation. For example, a one standard deviation increase in high school GPA was associated with a .34 standard deviation increase in cumulative four-year college GPA, compared with a .19 standard deviation for the SAT II writing test, the SAT component that has the strongest association with grades in college” (p. 196). These findings are corroborated by the researchers’ analysis of student data from the National Student Clearinghouse from students in Chicago Public Schools (a school system with a high proportion of minority students). “The study identified an unweighted GPA of 3.0 as a key benchmark for college readiness--a cutoff that gave students a 50 percent or greater likelihood of graduating from a four year college within six years” (p. 196). Again, the statistics for GPA of minority students is not encouraging, “Only 25 percent of all Chicago graduates, and even fewer minority male graduates, had a GPA of at least 3.0. Only 8 percent of African American and 13 percent of Latino male graduates had a GPA of 3.0 or higher, as compared with 18 percent of African American female and 25 percent of Latino female graduates” (p. 196). The same gender gaps did not exist for ACT test scores (Roderick et al., 2009).

It is encouraging that an effort to increase minority access to college education appears to be successful. However, it is discouraging that the general lack of college readiness persists despite such efforts as the American Diploma Project and the push for common core standards.

History of the AVID Program

In response to an influx of disadvantaged minority students into her suburban San Diego high school, Mary Catherine Swanson created an academic support system, Achievement Via Individual Determination (AVID) (AVID, n.d.). To encourage minority students to enroll in advanced coursework, she developed an AVID elective class to help these students develop organizational skills and acquire learning strategies. The ultimate goal of her philosophy, “rigor without support is a prescription for failure and support without rigor is a tragic waste of potential” (Swanson, 2000, p. 26) was to prepare disadvantaged and underachieving students to enter four year colleges and universities (Swanson, 1989). To accomplish this goal, Swanson, an English teacher, taught academic survival strategies such as Cornell Notes, a systematic note taking system and required students to keep an AVID binder (Swanson, 1996). She also focused specifically on helping AVID students develop college level writing skills, a strategy she termed “writing-to-learn” (Swanson, 1996, p. 24).

In 1996, Swanson was asked to develop an AVID curriculum under the auspices of the San Diego Office of Education and the AVID high school curriculum was published that same year. Another key component of the program, initiated at the same time, was a professional development model for AVID teachers and administrators (Swanson, 1996).

Four years later in 2000, AVID had spread to over 600 California schools and was reaching more than 40,000 middle and high school students. Swanson (2000) explained AVID’s phenomenal success, “AVID has grown because it engages students who are often overlooked as having college potential, develops the academic and social skills that empower them to access the most rigorous curriculum at their schools, and supports them in that acquisition” (p. 27).

The following year, Time magazine reported that AVID had spread from one San Diego high school in 1980 to 1,200 schools in 21 states by 2001 impacting over 65,000 students

nationwide (Goldstein, 2001). Goldstein (2001) also reported that Mary Catherine Swanson left the classroom in 1986 to found the AVID Center and one of her most vital functions as head of the organization was providing AVID training to over 9,000 teachers a year.

By the year 2006, according to AVID Center statistics as cited in Watt, Johnston, Huerta, Mendiola, and Alkan (2008), AVID had expanded to over 3,500 schools in 45 states and had been exported to 15 countries. AVID has shown a steady and continuous market expansion from its inception in 1980 to the present. AVID currently serves, in the year 2014, over 700,000 students in 4,837 schools across the United States. In 2014, AVID has schools located in 45 states, and 16 foreign countries (AVID, n.d.).

AVID's Program Components

AVID is described by Ensor (2009) as "...a nationally recognized program that was created in San Diego, California in 1980 and is designed to give high school students who ordinarily would not participate in rigorous academic, college-preparatory classes the opportunity to succeed in these high level classes" (p. 17). Watt et al. (2008) identify their target population, "AVID targets students from the academic middle—those who earn Bs, Cs, and Ds—and who have the willingness and potential to succeed in more rigorous coursework. Student selection for AVID also takes into consideration whether students are members of underserved groups. Most AVID students are underrepresented minorities (19 % African American, 49 % Hispanic) who are often economically disadvantaged first-generation college attendees" (p. 18, AVID Center, 2006a as cited from Watt et al., 2008).

AVID certified schools must successfully implement the 11 essential elements established by the founding organization. Included are the following requirements:

- Student participants must volunteer to be in the program and be selected to participate

- Participants must be enrolled in rigorous courses and in the AVID elective class
- Instruction in writing, reading, collaboration, and inquiry will be a hallmark
- Student data will be collected and reported
- Collaboration teams will be established and function throughout the year
- Team members will participate in on-going AVID professional development courses (Lozano, Watt & Huerta, 2009; Swanson, 2000; Watt, Huerta, & Lozano, 2007; Watt, Powell, Mendiola, & Cossio, 2006).

AVID utilizes two important strategies to facilitate organization and encourage critical thinking. Nelson (2000) explained the importance of recording class notes to create more effective use of study time,

Cornell notes prompt students to record and then ask questions about class material, promoting active learning and increasing student understanding. Students take notes on the right-hand side of a page divided into two columns and then ask summary questions on the left. A summary of the notes is written on the bottom one-fourth of the paper. (p. 73)

Twice a week AVID students participate in small group interactions with facilitators trained in the Socratic questioning technique. Nelson described the process in his research study, “In a Socratic seminar, participants seek deeper understanding of complex ideas through thoughtful dialogue, rather than by memorizing bits of information. Students develop the high-level critical thinking skills they will need to succeed in college-prep classes” (p. 73).

Ensor (2009) praised the support AVID students received to prepare for college and understand the college admission process. He noted that the AVID elective provided insight to

students about the requirements for college admission, including financial aid, and helped students explore college choices.

Validation of AVID's Eleven Essential Elements

Mary Catherine Swanson, founder of the AVID program collected data on student participants from the onset of the program (Swanson, 2000). In 1986, when she was hired by the San Diego County Office of Education as the AVID coordinator, she implemented an assessment system to ensure fidelity of the AVID model (Johnson, Nickel, Popp, & Marcus, 2011). This evaluation system eventually became AVID's Eleven Essential Elements. "In 2001, the Center for Research, Evaluation, and Training in Education (CREATE) conducted a study to assess the efficacy of the Eleven AVID Essentials" (Johnson, et al., 2011, p. 3). Ten years later, Johnson, et al. (2011) conducted a reevaluation study evaluating the validity and psychometric properties of the AVID Certification Self-Study (CSS). The CSS is an instrument designed to measure implementation fidelity for the AVID program in secondary schools. Each of the Eleven Essential categories is rated on a scale of zero to three: Level 0-Non-AVID, Level 1-Meets Certification Standards, Level 2-Routine Use, and Level 3-Institutionalization. Scores from the CSS place schools in one of three categories: Non-Certified/Affiliate, Certified, and Demonstration. Schools achieve a Demonstration rating by achieving scores on all essential elements at the Level 2 rating or above. In addition, Demonstration schools must be certified for at least three years and have a recommendation from an AVID Regional or District Director that is validated by an AVID onsite visit. Certified schools must have all Eleven Essentials rated at a Level 1 or higher and if a school has any of the elements rated at a Level 0 it is rated as a Non-Certified/ Affiliate school (Johnson, et al., 2011).

Data for the study came from 18, 449 AVID seniors enrolled at 870 high schools who were surveyed using AVID's Senior Data Collection Information instrument. The following characteristics were correlated to the classification of the high school: completion of college entrance requirements, enrollment in Advance Placement (AP) or International Baccalaureate (IB) coursework, participation in AP or IB exams, SAT or ACT exam participation, completion of the Free Application for Federal Student Aid (FAFSA), application to a 4-year college or university, acceptance at a 4-year college or university of those who applied, and percentage indicating intent to attend college or university of those accepted (Johnson, et al., 2011).

For every category evaluated except the percentage of seniors planning to attend a 4-year institution a significantly higher proportion of seniors meeting the criteria were enrolled at a school with Demonstration status than Certified or non-Certified status. For the category of seniors planning to attend a 4-year college or university, a significantly higher percentage of seniors meeting the criteria were enrolled in either a Demonstration (77.9 %) or Certified (74.0 %) high school than a Non-Certified (64.4 %) high school (Johnson, et al., 2011).

Researchers concluded that the scales measuring all of the Eleven Essentials for high school programs "met sufficient levels of internal consistency" (Johnson et al., 2011, p. 14). Researchers had hypothesized that AVID sites with higher levels of implementation fidelity (Demonstration status) would exhibit greater validity by demonstrating higher levels of student achievement. Johnson, et al. (2011) found that, "This hypothesis was supported such that schools implementing AVID at the highest levels of fidelity evidenced significantly higher student achievement across all academic and course enrollment outcomes" (p. 15). Their results are consistent with those of previous researchers supporting the importance of program fidelity to producing desired student achievement outcomes.

AVID's Effectiveness

A review of the literature discovered only one research study conducted in the last five years to evaluate the effectiveness of the AVID program. Black, Little, McCoach, Purcell, and Seigle (2008) conducted a mixed methods study of two cohorts of middle school students from separate schools. The researchers conducted surveys and interviews of the participants and their parents soliciting their perceptions of AVID's effectiveness. The quantitative portion of the study compared each AVID cohort to a non-AVID comparison school with regards to standardized test scores, Language Arts grades, and attendance statistics.

The results of the quantitative evaluation produced inconsistent results as to the effectiveness of the AVID program. For Cohort 1 there was no statistically significant difference in Language Arts grades or standardized test scores in any area. Students in the comparison group actually had statistically fewer absences than the AVID students in Cohort 1. For Cohort 2, AVID students had statistically significant higher Language Arts grades and higher standardized test scores in writing. AVID has specific emphasis on reading and writing which validates Black et al.'s findings (Watt et al., 2008).

It is important to note, however, that neither of the comparison schools was demographically matched to the AVID cohort schools.

Cohort 1 demographics:

- Only 3 % white students
- 0 % Asian students
- 10 % African American students
- 52 % Hispanic students
- 35 % listed as other.

Comparison school for Cohort 1 demographics:

- 5.5 % white students
- 5.5 % Asian students
- 0 % African American students
- 78 % Hispanic students
- 11 % listed as other.

The groups were not equivalent with the AVID school having higher percentages of underserved students, 97 % rate than the comparison school which had only 89 %. Cohort 2 had even greater disparity.

Cohort 2 demographics:

- 10 % white students
- 14.5 % African American students
- 2 % Asian students
- 53 % Hispanic students
- 20.5 % listed as other.

Comparison school for Cohort 2 demographics:

- 14 % white students
- 0 % African American students
- 14 % Asian students
- 52 % Hispanic students
- 5 % Native American students
- 14 % listed as other (Black et al., 2008).

The AVID school had 87 % underserved minority students while the comparison school only had 71 % (Black et al., 2008).

The researchers made the following statement about the qualitative portion of the study: “if the evaluation study had exclusively considered stakeholder perceptions of program effectiveness, we would have concluded that the program was universally successful in affecting student academic outcome variables for both cohorts” (Black et al., 2008, p. 121). Parents of students from both cohorts reported “improvement in their children’s academic habits, and expectations for their student’s academic success” (Black et al., 2008, p. 121).

Conley’s college readiness model incorporates both cognitive components-- key cognitive strategies and key content knowledge, and behavioral components-- academic behaviors. Black et al.’s qualitative results clearly support the conclusion that AVID develops academic behaviors within its participants.

AVID’s Success in Increasing College Enrollment and Retention

In response to AVID’s mission to prepare disadvantaged underachieving students to enroll in four year colleges and universities (Swanson, 1989, AVID, n.d.), the vast majority of the original research studies and published articles about AVID focused on the college acceptance and retention rates of its graduates. Mary Catherine Swanson (1989) discussed the program’s success in an article in *Educational Leadership*:

What has AVID achieved? Of the first six classes that the Clairemont project has graduated, 178 of 181 AVID students enrolled in colleges, 89 % in four year institutions and 11 % in community colleges. At San Diego University, the cumulative grade point average of the first six classes was 2.46; the freshman average was 1.9. At the University

of California at San Diego, AVID graduates earned a cumulative average of 2.47 while the overall freshman average was 2.83. (p. 63-64)

Time Magazine in its 2001 article highlighting the accomplishments of AVID founder Mary Catherine Swanson identified the following statistics:

The results have been extraordinary. Since 1980, more than 93 % of AVID graduates (70 % of whom were poor enough to have received federally subsidized lunches) have gone to college. (On average, 63 % of high school graduates attend college). And 85 % of the AVID kids in college were still enrolled two years later, compared with about 70 % of college entrants. (Goldstein, 2001, p. 84)

Watt, Huerta, and Lozano (2007) compared AVID and a similar college preparatory program, GEAR UP, in how they helped students understand the college admission process and how they prepared students for college enrollment. The researchers found that AVID students received significantly better college preparation than either the control group or the GEAR UP students. AVID students also displayed the highest level of college knowledge of the three groups.

In a similar study by the same authors two years later, Lozano, Watt, and Huerta (2009) compared the same three groups of students from 2007 with regard to the percentages of students they had graduating in each of the three Texas graduation plans. The graduation plan with the most rigorous standards is labeled distinguished, the next is recommended, and the least difficult is minimum. The control group had the highest percentage in the distinguished plan at 59.4 % and the AVID students were a close second at 52.9 %. The researchers noted that the demographics of the control group, with respect to family education and income, were markedly higher than the research groups.

Mendiola, Watt, and Huerta (2010) examined the retention rates of AVID students of Mexican-American descent in a four year university. Their study showed that 79 % of the AVID graduates were on track to graduate from the university within six years. To meet this criterion, students had to complete a minimum of 20 semester hours per year, could not be on academic probation or suspension, and must have a grade point average of 2.0 or better. The entire student body at the same university had a significantly lower rate of only 25-35 % of the students on track for graduation in six years. The researchers concluded that the AVID program provided skills that Hispanic students needed to persevere in college.

The results of Mendiola et al. (2010) were confirmed in a similar study by Watt, Huerta, and Alkan (2011) in that 60 % of AVID students were on track to graduate in six years or less compared with 30-36 % of the entire student population. Watt et al. also found that AVID freshmen at the same four year college had an 80 % retention rate compared to a lower rate of 71.5% in the entire freshman population.

AVID Program Factors Contributing to Retention or Attrition

One of the unique characteristics of the AVID program requirements is that students must self-enroll in the program, in other words, participation is voluntary (AVID, n.d.). As a result, students can voluntarily withdraw from the program at any time. Reported statistics on high school achievement, college readiness, college entrance exam scores, and college retention are all based on students currently enrolled in the AVID program or who were enrolled in the AVID program at graduation (AVID, n.d.; Black, Little, McCoach, Purcell, & Seigle, 2008; Mendiola, Watt, & Huerta, 2010; Mendiola, Watt, Huerta, & Lozano, 2007; Watt, Huerta, & Alkan, 2011; Watt, Huerta, & Lozano, 2009). Students who have voluntarily withdrawn from the AVID program are not included in the reported statistics. Watt, Johnson, Huerta, Mendiola, and Alkan

(2008), examined the factors that caused students to continue in the AVID program until graduation or to withdraw from the program prior to graduation.

Watt, et al. (2008), utilized a mixed method study in order “to triangulate data sources and make the study more trustworthy” (p. 19). The participants were students from AVID programs in California and Texas because these two states had the longest history with the AVID program. The two high schools in California with the highest AVID retention rates (78 % and 100 %) and the two high schools with the lowest retention rates (34 % and 38 %) and the two high schools from Texas with the highest retention rates (65 % and 71 %) and the two high school with the lowest retention rates (21 % and 22 %) were selected for the study. An additional criterion for inclusion in the study was that the high school must have implemented the AVID program for a minimum of four years. The authors noted that the schools were not matched for demographics and that “the demographic makeup and geographic locations were very diverse across the eight sites” (Watt, et al., 2008, p. 20).

Quantitative data was collected through surveys and qualitative data through the use of focus groups. Themes that emerged from compiling the two data sources showed that reasons students stayed in the AVID program were a feeling of family, AVID support and academic strategies, and teacher preparedness. Students cited themes of scheduling conflicts, financial and academic pressures, and lack of family support as reasons they did not continue in the AVID program (Watt, et al., 2008).

The primary reason listed by participants for staying in the AVID program until graduation was they considered their fellow students and their AVID teachers as family. Many first generation college students and those from underrepresented socioeconomic groups reported a lack of encouragement from their own families and AVID provided the critical familial support

they were not receiving. One AVID senior capsulated the consensus, “My parents weren’t as educated about college until (the AVID teacher) talked to them to educate them on that. I get a lot of motivation from that now that they know the advantage I get from going to college and receiving my college degree. Until they knew what college can bring for me, they thought it was a waste of money” (Watt, et al., 2008, p. 28).

The greatest obstacle seniors listed for not continuing in the AVID program until graduation was scheduling conflicts that prevented enrolment in the AVID elective class. Students must be enrolled in the AVID elective to stay in the program and seniors sometimes had to choose between advanced coursework and the AVID elective. Watt, et al. (2008) made the following observation, “Although scheduling and meeting graduation requirements were factors that led to some students dropping out of AVID, lack of dedication and scholarship may have caused the scheduling problems in the first place. In other words, students who did not keep up with their grades either left AVID or were removed from AVID” (p. 33).

Another significant finding of the Watt, et al. (2008) study was the importance of a student’s belief that he/she could succeed, “If the AVID student believes that success is possible the student continues to participate; if the student believes success is not possible, the student eventually drops out” (p. 35). After analyzing the collective data, researchers came to the following conclusion, “Students who felt nurtured stayed in the AVID program and students who did not develop this feeling of belonging dropped the AVID class” (Watt et al., 2008, p. 32-33). These findings reinforce the importance of the AVID elective teacher and the quality of the AVID elective class in preventing attrition to the program.

This conclusion is reinforced by Contreras (2011) literature review of college intervention programs for underrepresented K-12 students throughout the United States.

Contreras examined the literature evaluating college intervention programs with the following objectives:

- (a) Discuss the unique challenges and opportunities that exist for supporting gifted and academically talented underrepresented youth, (b) provide an overview of literature on the transition to college and best approaches for college transition for under-represented high-achieving students, (c) provide an overview of select promising programs and their outcomes, and (d) provide recommendations for partnership efforts to enhance program effectiveness and increase access to college for high-achieving underrepresented students. (p, 503).

After analyzing an extensive number of minority intervention programs, including the AVID program, Contreras (2011) provided the following summary, “The one consistent and apparent feature of the successful intervention programs reviewed, but not always represented in the program evaluations, was the passion, dedication, and commitment of staff to improving the lives of youth, in these programs” (p. 522). The author made the following observation about AVID in particular,

Mehan and colleagues (1996), in particular, found that perhaps the most notable feature of AVID was the development of strong peer networks and relationships that created an environment conducive for learning and achievement. This finding is consistent with the work of sociologists like Stanton-Salazar and Spina (2005), who describe the importance of fortuitous relationships in promoting academic success among underrepresented youth. (Contreras, 2011, p. 511)

The Effect of AVID Exposure Longevity on Student Achievement and College Readiness

Previous research speculated that students would need to be enrolled in the AVID program for a minimum number of years to produce a significant effect on student achievement and college readiness (AVID, n.d.). Huerta, Watt, and Butcher (2013) examined the difference in high school performance and college readiness between students enrolled in the AVID program in middle school and high school and students enrolled in AVID in high school only.

Huerta et al. (2013) collected data quantitatively using an on-line instrument of 3,143 AVID seniors. The on-line survey, Senior Data Collection Form, solicited responses from 22,880 AVID seniors in the spring of 2009. Students self-reported their ACT and SAT scores, their overall Grade Point Average (GPA), and course content including the number of Advanced Placement (AP) courses taken and other courses taken for college credit. Respondents were separated into cohorts, Cohort 1 being seniors enrolled in AVID only in high school and Cohort 2 consisting of seniors enrolled in AVID in both middle school and high school. Of the total number of respondents, 11,641 reported participating in AVID in high school only ranging from 1-4 years of participation. Seniors reporting enrollment in AVID beginning in either seventh or eighth grade and continuing throughout high school consisted of 3,986 respondents. Cohort 2 participants thus reported continuous AVID enrollment for five or six years (Huerta et al., 2013).

Out of the 15,627 respondents, researchers randomly selected 20 % to be included in their analysis. The number of respondents analyzed from Cohort 1-AVID High School Only consisted of 2,355 AVID seniors. Researchers analyzed responses from 788 AVID seniors from Cohort 2-AVID Middle School and High School. Demographic characteristics were compared between the two test populations and they were determined to be representative populations (Huerta et al., 2013).

Researchers compared the two cohorts for overall and academic GPA, college admission test scores, and number of courses taken for college credit. Data was also analyzed to compare the effect of AVID enrollment in high school only with enrollment in both middle school and high school on high school course content, rigor, and student enrollment in rigorous coursework. No significant differences were found between the two cohorts for SAT or ACT test scores. Student academic performance as measured by overall GPA did show a significant difference with Cohort 1 having a mean overall GPA of 3.07 while Cohort 2 had a mean overall GPA of 3.16. The same results were found for academic GPA with Cohort 1 having a mean of 3.03 and Cohort 2 having a mean of 3.14. According to Huerta et al. (2013), “These results indicate that seniors who participated in AVID in both middle school and high school exhibited higher levels of academic performance than seniors who only participated in AVID while in high school” (p. 33).

Analysis of data from the two cohorts also found that seniors in Cohort 2 took a significantly higher number of AP courses and AP exams than Cohort 1. Huerta et al. (2013) made the following conclusions,

...findings reaffirm the notion that the longer a student is engaged in college preparation activities and AVID in particular, the more prepared that student is for high school rigor and college readiness. When compared to seniors that only participated in AVID while in high school, seniors who participated in AVID in both middle school and high school exhibited greater academic performance, were more likely to take rigorous courses, and took on average more AP courses and AP exams. (p. 34-35)

Teacher Leadership Development Through AVID

The most recent trend in AVID literature is research studies examining the effect of AVID's professional development training on creating teacher leaders. Watt, Powell, Mendiola, and Cossio (2006) state the significance of professional development to the success of the AVID program, "Cited as one of the key ingredients to AVID's success, its intensive, sustained professional development begins with AVID summer institutes held throughout the country" (p. 61). Teachers, administrators, and school counselors are taught how to "use AVID techniques, strategies, and curriculum, as well as, how to disseminate AVID philosophy and teachings to a schoolwide audience" (Watt et al., 2006, p. 61).

Huerta, Watt, and Alkan (2008) cite Swanson (2005) in re-stating the contention that the professional development process of the AVID program is one of the most important contributions to its success. The results of the study by Huerta et al. showed that participation in AVID professional development was a significant predictor of teacher leadership. Watt, Huerta, and Mills (2010) further explored this relationship between AVID professional development and teacher leadership. Their study confirmed the findings of Huerta et al. (2008) that the more exposure to AVID professional development, the stronger the impact on teacher leadership. Teacher leadership increased as teachers were exposed to more AVID professional development opportunities.

AVID's professional development program provided instruction and practice in the use of writing, collaboration, reading, and inquiry (Watt, Huerta, & Mills, 2010) and these skills led to increased teacher effectiveness and competency. Watt, Mills, and Huerta (2010) concluded that AVID's professional development increased school culture which caused AVID demonstration schools to have significantly higher culture and climate.

AVID's Impact on School Culture and Climate through Professional Development

School culture and climate are critical components in any school reform efforts because they directly influence teacher ownership of the reform movement (Watt, Mills, & Huerta, 2010). Recognizing the vital importance of teacher attitudes to successful reform efforts, Watt, Mills, and Huerta (2010), examined the effect of AVID professional development initiatives on school culture and climate. Researchers examined two components associated with AVID professional development, the number of years of AVID implementation within the school and whether or not the school had achieved demonstration status. The study interestingly found no correlation between the number of years a school had been implementing the AVID program and a perception of positive school culture and climate. “Simply having AVID at a school over an extended period is not a guarantee that improvements in school culture and climate will occur” (p. 177). AVID demonstration schools, however, exhibited higher levels of school culture for group cooperation, academic press, and professional teacher behavior (Watt, Mills, & Huerta, 2010). These results are not surprising because to achieve demonstration status schools must involve the entire site team in the process. In addition, “In their pursuit of acquiring demonstration status, AVID schools must show high expectations and standards for student achievement (achievement press) as well as a commitment to students and collegial cooperation (professional teacher behavior)” (Watt, Mills, and Huerta, 2010, p. 177).

Watt, Mills, and Huerta (2010) surveyed over 3,100 middle and high school teachers attending one of eight AVID summer institutes throughout the United States. Out of the respondents, 2,231 responses were included in the study because any incomplete surveys were removed. Teachers were asked to assess school culture based on the following components: group openness, group cooperation, and group atmosphere. School culture was measured by

collegial leadership, professional teacher behavior, and achievement press (Watt, Mills, and Huerta, 2010).

Teacher responses, as a whole, indicated that “AVID had a slight to moderate impact on school culture” (Watt, Mills, and Huerta, 2010, p. 178). The area receiving the highest scores was group openness, “suggesting that AVID may be especially beneficial in supporting a willingness to share facts, ideas, values, and beliefs” (p. 178). School climate also rated between slight to moderate impact with achievement press and professional teacher behavior rating slightly higher than collegial leadership (Watt, Mills, and Huerta, 2010).

Researchers came to the following conclusions, “Findings revealed that the number of years that a school has been implementing AVID is not associated with that school’s culture and climate, however, AVID schools at the highest level of certification, demonstration status, reported significantly higher levels of culture and climate than did nondemonstration schools” (Watt, Mills, and Huerta, 2010, p. 181). They went on to say, “Although the findings regarding AVID implementation are preliminary and exploratory, one can cautiously propose that proper program implementation is associated with more favorable school culture and climate” (Watt, Mills, and Huerta, 2010, p. 181).

AVID’s Impact on School Accountability

Only one research study examined the impact of AVID programs on individual school accountability and the impact of AVID schools on district-wide accountability. The results of this study were so dramatic, however, that it could be considered a landmark study. Watt, Powell, Mendiola, and Cossio (2006) compared school and district accountability measures for AVID schools and the districts which contained them and for non-AVID schools and their districts. Watt et al. (2006) found that the performance profiles of all the AVID schools and their

districts improved over the four years they were studied and the performance profiles of the non-AVID schools and their districts did not show the same levels of improvement even though they had similar demographics.

Summary

While 35 states participate in the American Diploma Project, there is no evidence of any research that has been done to evaluate the impact of their efforts on the college readiness of their students. One report and two articles do appear in the literature describing the college readiness efforts of California (Spence, 2009), Washington State (Pettit & Prince, 2010), and New Mexico (New Mexico Public Education Department, 2010). These publications merely describe the efforts being undertaken by each state and the characteristics of the initiatives they are utilizing.

Florida has not identified nor developed a statewide program to assist in raising the college readiness of its high school graduates. Twenty-seven of Florida's school districts, particularly its larger school districts, have incorporated the AVID program in their middle schools, high schools, or both (Florida Department of Education, n.d.). The schools currently implementing AVID have teachers already trained to use AVID strategies. If a statistically significant difference in college readiness is shown to exist between students enrolled in AVID and students never enrolled in AVID, then Florida schools and school districts may choose to extend AVID strategies to a larger population of students than is currently benefiting from the program.

Rather than investing in a new statewide initiative to increase college readiness, AVID may provide the solution to the college readiness dilemma for Florida students. Other states throughout the country who are already invested in the AVID program for their underserved

minority and economically disadvantaged students may also decide to extend the program components to a wider population of their students.

CHAPTER THREE: METHODOLOGY

Introduction

The research project employed a causal comparative design with the purpose of determining if students enrolled in the AVID program showed a difference in college readiness (as measured by the *ACT College Readiness Benchmarks*) from students who were never enrolled in the AVID program. The purpose of this causal comparative study was to examine the tenets of the theory of self-determination (Deci & Ryan, 2000) by comparing Central Florida high school students enrolled in the AVID program and Central Florida high school students never enrolled in the AVID program for college readiness as measured by *ACT College Readiness Benchmark* scores. The independent variable was generally defined as students enrolled in a college readiness system that is designed to increase student-wide learning and performance (AVID, n.d.). The dependent variable was generally defined as *ACT's College Readiness Benchmarks* specifically The ACT Composite scores, ACT English scores and ACT Math scores, the minimum ACT test scores required for students to have a high probability of success in credit bearing college courses (The ACT, n.d.) The control variable of student demographics including race, gender, Title 1 status, socio-economic status (as measured by free and reduced lunch status), and grade level was controlled by matching AVID participants to non-AVID participants for these dimensions.

The research design sought to answer the following research questions:

RQ1: Will there be a difference in college readiness (as measured by the *ACT College Readiness Benchmarks*) between high school students enrolled in the AVID program for three or more years and high school students who have never been enrolled in the AVID program?

RQ2: Will there be a difference in English college readiness between high school students enrolled in the AVID program for three or more years and high school students who have never been enrolled in the AVID program?

RQ3: Will there be a difference in mathematics college readiness between high school students enrolled in the AVID program for three or more years and high school students who have never been enrolled in the AVID program?

This chapter will identify the participants of the study, its setting and geographic location, the procedures that will be utilized, and the instrument that will be used to measure the dependent variable of college readiness. A description of the proposed data analysis will also be included.

Hypotheses

Null Hypothesis **H₀₁**: There will be no statistically significant difference in college readiness, as measured by the *ACT College Readiness Benchmarks*, between high school students enrolled in the AVID program for three or more years and high school students never enrolled in the AVID program.

Null Hypothesis **H₀₂**: There will be no statistically significant difference in college readiness for English, as measured by the *ACT College English Benchmark*, between high school students enrolled in the AVID program for three or more years and high school students never enrolled in the AVID program.

Null Hypothesis **H₀₃**: There will be no statistically significant difference in college readiness for mathematics, as measured by the *ACT College Mathematics Benchmark*, between high school students enrolled in the AVID program for three or more years and high school students never enrolled in the AVID program.

Participants

A convenience sample of students enrolled in the AVID program and the comparison group of students never enrolled in the AVID program were selected from a large Central Florida public school district where the researcher is employed. The AVID participants were selected from the AVID high school that had the longest AVID experience in the target district and consisted of all the 11th and 12th grade students enrolled in the AVID program for three or more years. The non-AVID counterparts were selected based upon matching demographic data from a non-AVID high school in the target district. The sample consisted of 63 AVID students and 63 non-AVID matching students which are above the threshold of 62 participants suggested by Howell (2008). The student sample was chosen because of convenience to the researcher and the availability of samples for both dimensions of independent variable (AVID and non-AVID students) but also because the results may be significant to the target district and state where the district resides. Once IRB approval was granted for the research project, approval was requested from the target school district to utilize students and student data from high schools within the district.

The target school district had eleven high schools and five combination junior/senior high schools (Central Florida School District, n.d.). The demographic information for the target school district was as follows:

- 63.4% White
- 14.4% African American
- 12.9% Hispanic
- 2.1% Asian
- 0.2% Native American or Alaskan Native

- 6.8% Two or more races
- 45.4% Economically disadvantaged
- 15.6% Disabled
- 3.9% English language learners (ELL)

The AVID program was located in three of the eleven high schools and one of the five combination schools in the target district (Florida Department of Education, n.d.). AVID participants were selected from the high school in the target district having the longest AVID experience. This high school was also an AVID demonstration school and as such was required to adhere to all eleven AVID essential elements. The target high school, the only AVID National Demonstration School in the target school district, had the following demographics:

- 68.4% White
- 7.4% African American
- 13.3% Hispanic
- 2.7 % Asian
- 7.9% Two or more races
- 40.2% Economically disadvantaged
- 15% Disabled
- 2.8% English language learners
- Population of school: 1675 (Florida Department of Education, n.d.)

The criteria for inclusion in the research study was that participants must have participated in the AVID program for three or more years and must have taken the *ACT College Readiness Benchmarks* in 10th or 11th grade or both.

In order to minimize the threat to validity of the non-random selection of participants, the comparison group of non-AVID students were selected to match target participants for race, gender, Title 1 status, socio-economic status (as measured by free and reduced lunch status), and grade level (Gall, Gall, & Borg, 2010). For the last five years, disaggregated data on *ACT College Readiness Benchmarks* scores nationwide show a clear disparity between the benchmark scores of minority students and their white counterparts (The ACT, n.d.). Similar research demonstrates disparity in college performance and graduation rates between male and female students despite higher entrance rates for the male students (DiPrete & Buchman, 2006; Ewert, 2012). Moore et al. (2009) concluded, based upon their review of ten research studies exploring the effects of poverty on children, that poverty “has large and consistent associations with negative academic outcomes” (p. 4). Research conducted by Arslan (2013) examining the differences in perceptions of self-efficacy between students at various grade levels and determined that a student’s grade level significantly influenced his/her perception of self-efficacy. Self-efficacy is at the basis of Self-Determination Theory (Deci & Ryan, 2000) which forms the theoretical framework for AVID’s program components. Grade level differences, therefore, become a critical variable when examining student performance. If these extraneous variables were not controlled, the results of this research study could be confounded. For this reason, AVID participants were matched to non-AVID participants for race, gender, Title 1 status, socio-economic status, and grade level (Gall, Gall, & Borg, 2010).

The comparison group was selected from the high school in the district with the closest demographic match to the AVID demonstration school and which has never had an AVID program to eliminate the potential threat to validity of the AVID Effect (Watt et al., 2007). Watt et al., (2007) documented a school-wide AVID influence, called the AVID Effect, created in part

because the trained AVID elective teachers tend to utilize AVID strategies in their non-AVID elective courses. Students in the non-AVID group were also evaluated to determine if they have ever been enrolled in the AVID program or attended a school where AVID was present to ensure that students who may have transferred into the non-AVID high schools were not previously exposed to the AVID program. Because the non-AVID school did not provide enough students in several of the Mixed Race categories, those students were matched from their minority race categorical. In three cases because no match existed in either the Mixed Race category or in the minority category, the *ACT College Readiness Benchmark* scores for the AVID students were not included in the analysis of the data.

The target school district had a widely divergent demographic population. Schools within the district whose populations are primarily from beachside communities and affluent neighborhoods were less diverse and had fewer economically disadvantaged students than the AVID demonstration school from which the AVID participants were chosen. To increase the internal validity of the research study, the non-AVID comparison group was selected from the non-AVID school whose demographics were the most similar to the AVID demonstration school.

The demographic information for the non-AVID School was the following:

- 54.5% White
- 21.7% African American
- 16.4% Hispanic
- 1.1% Asian
- 6.0% Two or more race
- 43.7% Economically disadvantaged

- 12.6% Disabled
- 2.0% English language learners
- Population of the school: 1607 (Florida Department of Education website, n.d.)

Setting

The setting for this research project was a large public school district in Central Florida serving over 70,000 students in grades K-12. The district website listed the following demographics: 45.4 % of the students obtain free and reduced lunch, 36.4 % are reported as non-white or minorities, and 3.9 % of the students are identified as English Language Learners whose second language is English. The target school district had 11 high schools and five combination junior/senior high schools.

The target high school from which the AVID students were selected was an AVID demonstration school with the longest AVID experience in the target school district. AVID (n.d.) describes the characteristics of a national demonstration school, “AVID National Demonstration Schools are exemplary models of the program and demonstrate the very best AVID methodologies and strategies”. The school’s enrollment for 2012-2013 was 1675 students and listed the following demographic information for that school year; 40.2 % socioeconomically disadvantaged students, 23.4 % minority students, 15 % exceptional education students, 8 % gifted students, and 2.8 % English Language Learners (ELL) (Florida Department of Education, n.d.).

The target school district had a widely divergent demographic population. Schools within the district whose populations were primarily from beachside communities and affluent neighborhoods were less diverse and had fewer economically disadvantaged students than the AVID demonstration school from which the AVID participants were chosen (Central Florida

district, n.d.). To increase the internal validity of the research study, the non-AVID comparison group was selected from the non-AVID school whose demographics were the most similar to the AVID demonstration school.

Three years prior to the study, the target district developed and implemented a district wide instructional model (B.E.S.T). All teachers in the district were trained in the model and teachers new to the district were required to receive the same training. Teachers were expected to implement the model and their performance evaluation was based in large part on their fidelity of implementation of the model (Central Florida district, n.d.). For the school year 2012-2013, 95% of the target district teachers received a satisfactory or higher evaluation which would indicate that they were in fact utilizing the district instructional model (Central Florida district, n.d.). In addition, the target district had district approved curriculum for all courses and pacing guides were developed and distributed to teachers for all academic courses. Teachers were expected to adhere to the pacing guides and to teach the Florida State Standards in their courses (Central Florida district, n.d.). While no educational experience is completely equivalent, educational instruction in the target district utilized the same curriculum, the same pacing guides, and the same instructional model for all high schools in the district.

The difference between AVID and non-AVID students was in the instructional support they received not in content or instructional methodology. The AVID elective class and the AVID instructor utilized strategies such as Cornell notes to help students review and summarize information and Socratic Seminars to systematically explore concepts they did not fully understand (AVID, n.d.). AVID students attended tutorial sessions two days a week facilitated by an adult or college student. Students were expected and supported to take ownership for their own learning by bringing higher order questions to the twice weekly tutorials on “points of

confusion” from their academic classes (Bob McLaren, AVID Coordinator for the target school district, personal communication, February 4, 2014). These tutorials provided peer support and guidance for academic course content and helped build competence and autonomy in the AVID participants (Lozano, Watt & Huerta, 2009; Swanson, 2000; Watt, Huerta, & Lozano, 2007; Watt et al., 2006). The small family atmosphere of the AVID elective class promoted relatedness and a sense of security and belonging (Bob McLaren, AVID Coordinator for the target school district, personal communication, February 4, 2014). AVID did not teach academic course content but rather provided an academic support system to augment what was being taught in students’ academic courses (AVID, n.d.; Bob McLaren, AVID Coordinator for the target school district, personal communication, February 4, 2014).

Instrumentation

College Readiness Instrument

The measurement instrument which was used to measure the dependent variable college readiness was the *American College Testing Program (ACT) College Readiness Benchmarks* specifically the ACT Composite scores, ACT English scores and ACT Math scores. According to The ACT (n.d.), the ACT is a national college admission and placement examination that was first introduced in 1959. The ACT (n.d.) identifies the *ACT College Readiness Benchmarks* as measurements designed to predict success in college English composition, college algebra, social sciences, and biology courses. Students who meet or exceed the following benchmarks are predicted to have a 50% chance of achieving a B or better or a 75% chance of achieving a C or better in the corresponding college course.

Benchmark

Benchmark Score

English Composition

18

| | |
|-----------------|----|
| College Algebra | 22 |
| Social Sciences | 22 |
| Biology | 23 |

“The guiding principle underlying the development of the ACT is that the best way to predict success in college is to measure as directly as possible the degree to which each student has developed the academic skills and knowledge that are important for success in college (ACT Technical Manual, 2007, p. 62)”. Consequently, the test items on the ACT must be representative of the tasks students will be asked to perform in college courses. The ACT Technical Manual (2007) states that each individual test item has been “critically” examined over sixteen times and that the test specifications represent the curriculum content in current high schools and universities.

Construct validity data for the *ACT College Readiness Benchmarks* came from a research study by Allen and Sconing (2005) as cited in The ACT Technical Manual (2007). The study examined 76,122 students from 92 colleges to validate the English Composition Benchmark and 33,803 students from 85 colleges to validate the College Algebra Benchmark (The ACT Technical Manual, 2007). For the Biology Benchmark, the results included 14,136 students from 31 colleges and the Social Studies Benchmark analyzed data from 53,705 students from 45 colleges. The social studies component included data from courses in economics, history, political science, psychology, and sociology (The ACT Technical Manual, 2007).

The study used a hierarchical logistic regression to compare student scores on the *ACT College Readiness Benchmarks* with actual student performance in the corresponding college courses. A grade of B or higher was defined as success in the course (The ACT Technical Manual, 2007). According to the ACT Technical Manual, “The Benchmarks were determined

based on the median cut-off scores across colleges” (p. 77). Researchers chose a cut-off score of 0.50 probability of success in achieving a grade of B or better for each college course at each institution. The extremely large number of participants in this study strengthens the validity of the results and these Benchmarks are recognized nationally and internationally as a predictor of college readiness (The ACT Technical Manual, 2007).

The ACT Technical Manual (2007) reported median scale scores for reliability representing samples from 2000 examinees from the 2005-2006 national administrations. The reliability median scale scores are as follows: English--.91, Mathematics--.91, Reading--.85, Science--.80, and Composite--.96. Reliability coefficients estimate the consistency of test scores and range from a score of zero to one. A coefficient close to one indicates a higher consistency of scores over time and a score near zero indicates little to no consistency in scores over time (The ACT Technical Manual, 2007). A Composite reliability coefficient of .96 is extremely high and indicates strong consistency in scores over time. The English and Mathematics reliability coefficients of .91 are also very high and are an indication of strong consistency over time.

Procedures

After an IRB exemption was obtained from Liberty University, the researcher requested permission to use student data for research purposes from the target school district. Permission was granted and as a district employee the researcher had access to student data through part of the Performance Matters program entitled Baseball Cards. The researcher requested a list of AVID participants from the AVID demonstration school in 11th grade and 12th grade for the 2013-2014 school years. The list included the grade level of the student, race, and gender. The researcher used the Baseball Card program to generate a list of *ACT College Readiness*

Benchmark scores for the AVID students and to determine Title 1 status and free and reduced lunch status for each AVID student.

Utilizing the Baseball Cards program, the researcher was able to segregate the student population from the matching school by grade level, race, gender, Title 1 status, and free and reduced lunch status. The list included the ACT College Readiness Benchmark scores for 2012-2013 and 2013-2014. Using a random number generator program, the researcher entered the number range for each demographic group and generated a number corresponding to a student from the demographic profile group which corresponded to an AVID participant student. In other words, if the AVID participant was an African American Female Title 1 no free and reduced lunch student, then the researcher went to the pool of African American Female Title 1 no free and reduced lunch students from the matching school and generated a random number to select the matching student.

There were not as many mixed race students at the matching school as were in the AVID participant pool. Students who were mixed race and Hispanic were matched to Hispanic students and students who were mixed race and African American were matched to African American students. Three of the AVID participants had no corresponding non-AVID counterparts in their demographic profile group and so those students' scores were eliminated from the AVID participant pool and not included in the statistical analysis.

The data was then coded by number to protect the identities of the AVID participants and their matching counterparts. For the matched counterparts, the researcher included the randomly generated number out of the total number of students in the demographic profile group.

Once all of the AVID participants were linked to their non-AVID counterparts, the *ACT College Readiness Benchmark Scores* were identified for each student. If a student had taken the

ACT test in both 2012-2013 and 2013-2014, the first test score was used to reduce a testing threat to validity because some students had taken the test previously and others had not. The researcher compared the two sets of data to determine if a statistical difference existed between the AVID participants and their non-AVID counterparts for their ACT Composite scores, ACT English scores, and ACT Math scores. The researcher analyzed the *ACT College Readiness Benchmark* scores for the two independent variable groups, the students enrolled in AVID for three or more years and the students who have never been enrolled in AVID, to determine if a difference existed between the groups for the dependent variables.

Research Design

A causal comparative research design was chosen because the project does not involve the manipulation of the independent variable, student participation in the AVID program, but instead relies upon previously existing groups (students enrolled in the AVID program and students never enrolled in the AVID program). It would be impossible to randomly assign student participants into a testing group and a control group for experimental purposes because students self-selected to participate in the AVID program. Because participants could not be randomly assigned, the elements necessary for an experimental or quasi-experimental design were not present and so a causal comparative design was chosen (Gall, Gall, & Borg, 2010). Similar methodology was utilized by Fitzgerald, Gordon, Onwuegbuzic, Canty, Stitt, and Frels (2013) who compared archival data from the “Texas Education Association’s Academic Excellence Accountability System” (p. 1). Fitzgerald et al. utilized a causal comparative study to examine differences in graduation completion rates at different size high schools in Texas through the use of archival data. Moran (2008) also used a causal comparative research design when comparing the mathematics placement scores of entering freshman students against the

high school coursework they completed. The characteristics of these studies are very similar to this research study which compares the *ACT College Readiness Benchmarks*, specifically ACT Composite, ACT English, and ACT Math of students who participated in the AVID program for three or more years compared to students who never participated in the AVID program using archival data. These studies reinforced the decision to use a causal comparative design for this research project.

The research design was quantitative relying on a quantitative measure--the *ACT College Readiness Benchmarks* specifically the ACT Composite scores, ACT English scores, and ACT Math scores. The study determined if a difference existed for students who were enrolled in the AVID program for three or more years and between students who were never enrolled in the AVID program for the dependent variable college readiness.

The research questions for the study were:

RQ1: Will there be a difference in college readiness (as measured by the *ACT College Readiness Benchmarks*) between high school students enrolled in the AVID program for three or more years and high school students who have never been enrolled in the AVID program?

RQ2: Will there be a difference in English college readiness (as measured by the *ACT College Readiness Benchmark* for English) between high school students enrolled in the AVID program for three or more years and high school students who have never been enrolled in the AVID program?

RQ3: Will there be a difference in mathematics college readiness (as measured by the *ACT College Readiness Benchmark* for mathematics) between high school students

enrolled in the AVID program for three or more years and high school students who have never been enrolled in the AVID program?

Data Analysis

The data from the two levels of the independent variable, students enrolled in AVID for three or more years and students never enrolled in AVID, was evaluated using an independent t test for the dependent variable, *ACT College Readiness Benchmarks* specifically the ACT Composite scores, the ACT English scores, and the ACT Math scores. Three separate t tests were run to test the three null hypotheses and the significance level was set at 0.05. An independent t test was chosen because the two levels of the independent variable are independent of one another. In other words, the two groups contain completely different test subjects (Lowry, 1999-2013).

There are two assumptions that must be met in order to use an independent t test. The first is an assumption of normality: the two samples must be normally distributed (close to a bell-shaped curve). To determine normality, a Shapiro-Wilks test was run on both levels of the independent variable using a significance level of 0.05. In the case where one of the sample populations was not evenly distributed i.e. the non-AVID Math group, the Mann Whitney U Test was used to analyze the data because it was designed to be distribution-free (Huber & Wagner-Döbler, 2003). The Mann Whitney U Test, in addition to the independent t test, was used to test Null Hypothesis H_{03} : There will be no statistically significant difference in college readiness for mathematics, as measured by the *ACT College Mathematics Benchmark*, between high school students enrolled in the AVID program for three or more years and high school students never enrolled in the AVID program.

A second assumption that must be met was the assumption of homogeneity of variance that assumes the two levels of the independent variable have equal variances. To test for homogeneity Levene's Test of Equality of Variances was run because it is not dependent upon the normality of the two populations (Tabachnick & Fidell, 2013). A significance level of > 0.05 indicated that the two groups were homogeneous for variance. According to Adusah and Brooks (2011)

the independent t test is relatively robust to violations of the homogeneity of variance assumption when sample sizes are equal, or perhaps even just relatively equal. Stevens (1999) indicated that "unequal variances will distort the Type I error rate appreciably *only if* the group sizes are sharply unequal (largest/smallest > 1.5). (p. 9)

The sample populations in this case were equal and so even though the ACT Math groups did not have homogeneity of variance the assumption can be made that the independent t test is robust to those variations (Adusah & Brooks, 2011).

To determine the correct number of participants for the research study, Van Voorhis and Morgan (2007) make the following suggestions, "How many participants are needed to maintain adequate power when using statistics designed to detect differences? Given a medium to large effect size, 30 participants per cell should lead to about 80 % power (the minimum power suggested for an ordinary study)" (Cohen, 1988 as cited in Voorhis & Morgan, 2007, p. 48).

Working backwards using the equation $\delta^2 = d^2n/2$, where delta is 2.80 for an alpha level of .05 and a power level of .80 and a medium effect size of .5, the value of n can be calculated. For a power level of .80, with an alpha level of .05 for a two-tailed test and medium effect size of .5, the number of subjects necessary with two independent variables would be 62 (Howell, 2008). The research design included a larger sample than 62.

CHAPTER FOUR: FINDINGS

Introduction

The purpose of this causal comparative study was to examine the effectiveness of an educational program utilizing the tenets of the theory of self-determination (Deci & Ryan, 2000) by comparing Central Florida high school students enrolled in the AVID program and Central Florida high school students never enrolled in the AVID program, for college readiness as measured by *ACT College Readiness Benchmark*, specifically ACT Composite scores, ACT English scores, and ACT Math scores. The independent variable was generally defined as students enrolled in an AVID program, a college readiness system that is designed to increase student-wide learning and performance (AVID, n.d.). The dependent variables were generally defined as *ACT's College Readiness Benchmarks*, specifically ACT Composite scores, ACT English scores, and ACT Math scores, which define the minimum ACT test scores required for students to have a high probability of success in credit bearing college courses (The ACT, n.d.). The control variable of student demographics including race, gender, Title 1 status, socio-economic status (as measured by free and reduced lunch status), and grade level were controlled by matching AVID participants to non-AVID participants for these characteristics.

The analysis of the data includes Shapiro-Wilks analyses to establish normality and Levene's Test for Equality of Variance. *ACT College Readiness Benchmarks*, specifically ACT Composite scores, ACT English scores, and ACT Math scores, of the two groups of students were compared using individual *t* tests, AVID students compared to non-AVID students. In the cases where the Shapiro-Wilks analysis indicated that the populations did not have a normal distribution (i.e., the non-AVID Math group), a Mann Whitney U Test analysis was included in addition to the independent *t* test.

Descriptive Statistics

There are two assumptions that must be met in order to use an independent t test. The first is an assumption of normality; the two samples must be normally distributed (close to a bell-shaped curve). To determine normality, a Shapiro-Wilks test was run on both levels of the independent variable using a significance level of 0.05. In the cases where the two populations were not evenly distributed, the Mann Whitney U Test was used to analyze the data because it was designed to be distribution-free (Huber & Wagner-Döbler, 2003).

Shapiro-Wilks Analysis

The results of the Shapiro-Wilks analysis (See Table 1) on the AVID ACT Composite (W statistic = 0.947), the non-AVID ACT Composite (W statistic = 0.960), the AVID ACT English (W statistic = 0.989), the non-AVID ACT English (W statistic = 0.984), and the AVID ACT Math (W = 0.948) had W values above the critical level (Critical W = 0.947) indicating that the sample populations were normally distributed. The non-AVID Math Group did not have a W value above the critical level (W statistic = 0.887 and the Critical W = 0.947). Because the non-AVID ACT Math population did not meet the criteria of normal distribution, a Mann Whitney U Test was performed comparing the AVID ACT Math Scores and the non-AVID ACT Math Scores in addition to the independent t test.

Table 1

Shapiro-Wilks Analysis

| Group Analyzed | <i>M</i> | <i>SD</i> | s^2 | <i>W</i> | Critical W | <i>p</i> |
|------------------------|----------|-----------|--------|----------|---------------|----------|
| AVID ACT Composite | 19.746 | 3.374 | 11.386 | 0.967 | 0.947 | 0.0885 |
| Non-AVID ACT Composite | 18.111 | 2.990 | 8.939 | 0.960 | 0.947 | 0.0376 |
| AVID ACT English | 18.587 | 4.514 | 20.375 | 0.989 | 0.947 | 0.8366 |
| Non-AVID ACT English | 17.032 | 3.914 | 15.322 | 0.984 | 0.947 | 0.6054 |
| AVID ACT Math | 19.714 | 3.816 | 14.562 | 0.948 | 0.947 | 0.0096 |
| Non-AVID ACT Math | 18.175 | 3.046 | 9.275 | 0.887 | 0.947 | 0.00003 |

Note. *M* = mean, *SD* = standard deviation, s^2 = variance, *W* = statistic *W*, *p* = probability of significance

**p* < 0.05, significant at *p* < 0.05

Levene's Test for Equality of Variance Analysis

A second assumption that must be met was the assumption of homogeneity of variance which assumes the two levels of the independent variable have equal variances. To test for homogeneity, Levene's Test of Equality of Variances (See Table 2) was run because it is not dependent upon the normality of the two populations (Tabachnick & Fidell, 2013). A significance level of > 0.05 indicated that the two groups were homogeneous for variance. According to Adusah and Brooks (2011),

the independent *t* test is relatively robust to violations of the homogeneity of variance assumption when sample sizes are equal, or perhaps even just relatively equal. Stevens (1999) indicated that "unequal variances will distort the Type I error rate appreciably *only if* the group sizes are sharply unequal (largest/smallest > 1.5). (p. 9)

The sample populations in this case were equal and so even, though the ACT Math groups did

not have homogeneity of variance, the assumption can be made that the independent t test is robust to those variations (Adusah & Brooks, 2011).

In order for two populations to meet the assumption of homogeneity of variance, Levene's Test for Equality of Variances must produce a p value > 0.05 . The comparison of the variances between the AVID ACT Composite scores and the non-AVID ACT Composite scores showed homogeneity of variance ($p = 0.147, p > 0.05$). The comparison of the variances between the AVID ACT English scores and the non-AVID ACT English scores also showed homogeneity of variance ($p = 0.229, p > 0.05$). The comparison of the variances between the AVID ACT Math Scores and the non-AVID Math scores did not show homogeneity of variance ($p = 0.007, p < 0.05$).

Table 2

Levene's Test for Equality of Variances

| Group Analyzed | <i>F</i> | <i>p</i> |
|----------------|----------|----------|
| ACT Composite | 2.131 | .147 |
| ACT English | 1.463 | .229 |
| ACT Math | 7.633 | .007 |

Note. *F* = *F* value, *p* = probability of significance

**p* > 0.05, significant at the *p* > 0.05

Independent *t* test Analysis

The results of the independent *t* test (See Table 3) were significant for the comparison of AVID ACT Composite scores compared to non-AVID ACT Composite scores, $t(124) = 3.050$, $p = 0.003$, Cohen's $d = 0.513$. The effect size based upon Cohen (1992) was medium. The observed power was 0.98, indicating there is a 98% likelihood that the null hypothesis was correctly rejected. AVID students scored significantly higher on ACT Composite scores ($M = 19.746$, $SD = 3.374$, $n = 63$) than non-AVID students ($M = 18.016$, $SD = 2.981$, $n = 63$).

The results of the independent *t* test were significant for the comparison of AVID ACT English scores compared to non-AVID ACT English scores, $t(124) = 2.067$, $p = 0.041$, Cohen's $d = 0.368$. The effect size based upon Cohen (1992) was small to medium. The observed power was .83, indicating that there is an 83% likelihood that the null hypothesis was correctly rejected. AVID students scored significantly higher on ACT English scores ($M = 18.587$, $SD = 4.514$, $n = 63$) than non-AVID students ($M = 17.032$, $SD = 3.914$, $n = 63$).

The results of the independent *t* test were significant for the comparison of AVID ACT Math scores compared to non-AVID ACT Math scores, $t(124) = 2.503$, $p = 0.041$, Cohen's $d = 0.446$. The effect size based upon Cohen (1992) was medium. The observed power was 0.95,

indicating there is a 95% likelihood that the null hypothesis was correctly rejected. AVID students scored significantly higher on ACT Math scores ($M = 19.714$, $SD = 3.816$, $n = 63$) than non-AVID students ($M = 18.175$, $SD = 3.046$, $n = 63$).

Table 3

Independent t Test Results

| Group Analyzed | <i>df</i> | <i>t</i> | <i>p</i> | <i>d</i> | <i>N</i> | <i>n</i> | <i>MD</i> | <i>SMD</i> |
|-----------------------------|-----------|----------|----------|----------|----------|----------|-----------|------------|
| ACT Composite | 124 | 3.050 | .003 | 0.513 | 126 | 63 | 1.73016 | 0.56727 |
| ACT English | 124 | 2.067 | .041 | 0.368 | 126 | 63 | 1.55556 | 0.75274 |
| ACT Math | | | | | | | | |
| Equal variances assumed | 124 | 2.503 | .041 | 0.446 | 126 | 63 | 1.53968 | 0.61512 |
| Equal variances not assumed | 118 | 2.503 | .041 | 0.446 | 126 | 63 | 1.53968 | 0.61512 |

Note. *df* = degrees of freedom, *t* = t-test value, *p* = probability of significance, *d* = Cohen's *d*, *MD* = mean difference, *SMD* = standard error of the mean difference

**p* < 0.05, significant at the *p* < 0.05 level

Results

For AVID students compared to non-AVID students, all three null hypotheses were rejected.

Null Hypothesis H₀₁

There will be no statistically significant difference in college readiness, as measured by the *ACT College Readiness Benchmarks*, between high school students enrolled in the AVID program for three or more years and high school students never enrolled in the AVID program. The results of the independent *t* test showed a statistically significant difference in ACT Composite scores between AVID students and non-AVID students (*p* < 0.05).

Null Hypothesis H₀₂

There will be no statistically significant difference in college readiness for English, as measured by the *ACT College English Benchmark*, between high school students enrolled in the AVID program for three or more years and high school students never enrolled in the AVID program. The results of the independent *t* test showed a statistically significant difference in

ACT English scores between AVID students and non-AVID students ($p < 0.05$).

Null Hypothesis H_{03}

There will be no statistically significant difference in college readiness for mathematics, as measured by the *ACT College Mathematics Benchmark*, between high school students enrolled in the AVID program for three or more years and high school students never enrolled in the AVID program. The results of the independent t test showed a statistically significant difference in ACT Math scores between AVID students and non-AVID students ($p < 0.05$).

Additional Analysis

Mann Whitney Analysis

Because the non-AVID population for the ACT Math group did not have a normal distribution, the math groups were also compared using the Mann Whitney U Test (See Table 4). The comparison between the AVID and non-AVID students for ACT Math scores ($p = 0.02444$) were significantly different on the Mann Whitney U Test, $p < 0.05$ supporting the findings of the independent t test.

Mann-Whitney U Test

| Group Analyzed | <i>U</i> | <i>Z</i> | <i>p</i> |
|----------------|----------|----------|----------|
| ACT Math | 1522 | 2.2542 | 0.02444 |

Note. *U* = Mann-Whitney test value, *Z* = distance from the mean, *p* = probability of significance
**p* < 0.05, significant at the *p* < 0.05 level

CHAPTER FIVE: DISCUSSION

Introduction

The results of this research study rejected the null hypothesis stating there will be no statistically significant difference in college readiness, as measured by the *ACT College Readiness Benchmarks*, between high school students enrolled in the AVID program for three or more years and high school students never enrolled in the AVID program. There was a statistically significant difference between the ACT Composite scores, ACT English scores, and ACT Math scores of students who had participated in AVID and students who had not participated in AVID. Deci and Ryan's Self-Determination Theory (2000) support these results linking students' competence, autonomy, and relatedness to increased intrinsic motivation. AVID strategies are designed to increase competence, autonomy, and relatedness in its participants and are also linked to David Conley's (2010) college readiness dimensions. The results of this study indicate that AVID strategies increase college readiness in its participants. These results support the contention that exposure to AVID strategies could increase college readiness in all students. The target school district, as well as, the State of Florida may want to consider expanding student access to AVID strategies by offering these strategies to all students not just the underserved minority students currently recruited by the AVID program.

Summary of the Findings

The independent t test results comparing AVID participants from the AVID demonstration school with their non-AVID counterparts from the comparison school showed statistically significant differences for their ACT Composite scores ($p = .003, p < 0.05$), ACT English scores ($p = .041, p < 0.05$), and ACT Math scores ($p = .041, p < 0.05$). AVID participants had statistically higher scores on all three tests than their non-AVID counterparts.

According to The ACT (n.d.), Florida had the following average ACT College Readiness Benchmark scores for 2013: ACT Composite, 19.6; ACT English, 18.7; and ACT Math, 19.7. The average *ACT College Readiness Benchmark* scores for the AVID participants were ACT Composite, 19.7; ACT English 18.6, and ACT Math, 19.7.

The Florida Department of Education (n.d.) reports the Average Mean ACT scores rounded to the nearest whole number for all the students in the target school in 2013 as ACT Composite, 20; ACT English, 19; and ACT Math, 20. The *ACT College Readiness Benchmark* scores for AVID participants rounded to the nearest whole number were exactly the same, ACT Composite, 20; ACT English, 19; and ACT Math, 20.

Discussion of the Findings

Deci and Ryan's Self-Determination Theory (2000) links academic persistence, increased performance, and enhanced psychological health to the need for competence, autonomy, and relatedness. AVID students are required to enroll in rigorous college preparatory coursework and to participate in an AVID elective class designed to improve reading and writing competences, test-taking and study skills, and to develop note-taking and assignment tracking systems (Watt et al., 2008). The components of the AVID program through the AVID elective, student mentoring, and academic support structures, are designed to increase competence, autonomy, and relatedness. The results of this study suggest that AVID strategies create increased college readiness in its participants. Students participating in the AVID program for three or more years showed statistically higher college readiness scores in all three areas evaluated by this study, ACT Composite scores, ACT English scores, and ACT Math scores, than students who never participated in AVID. The *ACT College Readiness Benchmarks* are

designed to directly measure two of the four dimensions of Conley's (2010) college readiness components, Key Cognitive Strategies and Key Content Knowledge.

Meeting or exceeding the *ACT College Readiness Benchmarks* by definition "reflect a 50 % chance of a B or higher grade or a 75 % chance of a C or higher grade in entry-level, credit-bearing college English Composition, College Algebra, Social Sciences, and Biology courses" (The ACT, 2011). The results of this study show a definitive difference in college readiness for AVID participants compared to their non-AVID counterparts with almost half of the AVID students attaining a composite score greater than the Florida state average (48%) while less than one third of the non-AVID students (30%) were able to exceed that standard.

Because AVID incorporates strategies such as Reading to Learn and Writing to Learn, which are specifically designed to strengthen English skills, it was anticipated that AVID students would score significantly higher on the ACT English Benchmark and ACT Composite scores than non-AVID students. Students participating in the AVID program for three or more years did in fact score significantly higher on the ACT English Benchmark and ACT Composite than students never enrolled in the AVID program.

While the difference between the number of AVID students achieving the score needed to reach the English benchmark (57%) and the number of non-AVID students (44%) achieving that same score is relatively small, the encouraging and surprising result of analysis of the data was the difference in the number of AVID students meeting the ACT Math Benchmark compared with their non-AVID counterparts. More than twice the number of AVID participants met or exceeded the ACT Math Benchmark score of 22 (37%) than their non-AVID counterparts (16%). However, the actual percentages of both AVID and non-AVID students who met the ACT Math Benchmark were disappointing, with slightly over one third of the AVID students

having scores equal to or greater than 22 (37%) and only 16% of the non-AVID students meeting that standard. Nevertheless, AVID participants did significantly better than their non-AVID counterparts at meeting the ACT Math Readiness Benchmark.

It is somewhat disheartening that, even with the academic and personal support provided to the study participants through AVID, only 57% of the AVID participants were able to attain the ACT English Benchmark. This means that 43% will most likely require some remedial coursework before taking a college freshman English course. Likewise, only 37% of the AVID participants attained the ACT Math Benchmark, which means that 63% will require some remedial coursework before taking a College Algebra course.

However, these results were better than the Florida mean ACT Benchmark scores for 2013. The ACT (n.d) lists the percentage of Florida students meeting the ACT English Benchmark as 55% in 2013 (as compared with 57% of the AVID participants) and the percentage of Florida students meeting the ACT Math Benchmark as 36% in 2013 (as compared with 37% of the AVID participants in this study). Thus, the AVID participants exceeded those percentages in both cases.

The most surprising result was the difference in the number of students meeting the ACT Math Benchmark between the AVID participants, 23 students, and their non-AVID counterparts, 11 students. Upon reflection, it seems probable that the reason for such a profound difference was the academic support and encouragement provided to AVID students, instructing them in needed math skills and giving them the confidence to take higher level math courses. Students who are struggling in math may be unlikely to voluntarily extend themselves and take higher level courses than are required for graduation. On the other hand, all students are required to take four years of English. While students are not required to take Advanced Placement English

or even Honors English courses, they are required to take English all four years of high school. The target school district requires Algebra 1, Geometry, and some form of higher Algebra for graduation. Students are not required to pursue higher level math courses and it is unrealistic to suppose that students would voluntarily enroll in those courses without some type of academic support and encouragement. In contrast, the AVID program provides academic support for those students who may not have support available at home and strongly encourages students to enroll in higher level coursework, including math classes. The results of this study support research by Conley and French (2014) that student ownership of learning is a key component to college readiness. AVID students are required to take ownership of their learning by bringing questions from their academic subjects to the weekly Socratic Seminars. Socratic Seminars help students identify areas of weakness and obtain direction in strengthening those areas from their peers and facilitators. The tremendous difference in the number of AVID students meeting the College Readiness Benchmark for ACT Math is undoubtedly tied to an increase in their student ownership for learning developed through participation in AVID's self-efficacy programs.

The results of this study suggest that to increase college readiness in math, students must be supported academically and encouraged to enroll in higher level math courses; this support and encouragement is an integral part of the AVID program. Support and encouragement are particularly important for students who meet the AVID student demographic profile with high percentages of minority, Title 1, and free lunch status.

The racial profile of AVID participants in this study is weighted much more heavily to minority students than the school-wide demographic profile for the AVID demonstration school. The AVID participants, taken from the AVID demonstration school population as a whole, were 60% minority and 40% Caucasian. The AVID demonstration school as a whole was over 60%

Caucasian and less than 40% minority. The Florida Department of Education (n.d.) reports the Average Mean ACT scores rounded to the nearest whole number for all the students in the target school in 2013 as ACT Composite, 20; ACT English, 19; and ACT Math, 20. The *ACT College Readiness Benchmark* scores for AVID participants rounded to the nearest whole number were exactly the same, ACT Composite, 20; ACT English, 19; and ACT Math, 20.

This means that participation in the AVID program allowed a population with a much greater percentage of minority students to achieve identical results to the population of the target school as a whole. Conley and French (2014) make the case that student ownership of learning has increased relevance for traditionally lower achieving populations:

This issue becomes particularly important in contexts where achievement gaps exist. The formula being followed by many well-intentioned educators to close gaps in performance on measures of academic content knowledge is to intensify content transmission through more time devoted to teaching or reteaching content in areas identified as deficient on tests, particularly tests of English and mathematics knowledge. Enabling these students to understand the importance of ownership of learning and then providing them with curricular and instructional frameworks in which they can take ownership of their learning is a key ingredient in any program designed to close gaps in reading, writing, and mathematics performance. (p. 1029)

AVID strategies that help students achieve ownership for their learning may be one of the reasons AVID's higher population of traditionally lower achieving students were able to achieve the same results as the target district as a whole on the *ACT College Readiness Benchmarks* for ACT Composite, ACT English, and ACT Math.

Based upon these results, the case can be made that AVID strategies which promote competence, autonomy, and relatedness increase the college readiness of students, particularly minority students. This leads to the supposition that exposing all students to AVID strategies could increase their college readiness and reduce the amount of remedial instruction necessary to prepare them to be successful in college coursework.

Study Limitations

The greatest limitation of this study is that it is restricted to one school district and that the AVID participants came from only one school within that school district. Because AVID demonstration schools demand faithful adherence to AVID strategies, the researcher made the decision to use student participants from the only AVID demonstration school in the target district. Therefore, the results of this study can only be applied to the target school district. In order to extend the findings beyond the target district, future studies should include students from AVID demonstration schools throughout the State of Florida and match those students demographically to non-AVID students within the same school district. Larger samples of students and the inclusion of other schools and school districts throughout the state would extend the findings beyond the target school district.

While the findings of the study are limited to the target school district, the demographic profile of the AVID participants, 60 % minority students and 40 % Caucasian, is extremely similar to the demographics of the student population throughout Florida, 59 % minority and 41 % Caucasian (Florida Department of Education Membership Report, 2014). The demographic profile of students taking the *ACT College Readiness Benchmarks* in the State of Florida is also very similar to the AVID participants, 55 % minority students and 40 % Caucasian (5 % chose not to report their ethnicity) (The Act, n.d.). The *ACT College Readiness Benchmark* scores of

the AVID participants in this study were better than the Florida mean ACT Benchmark scores for 2013. The ACT (n.d) lists the percentage of Florida students meeting the ACT English Benchmark as 55% in 2013 (as compared with 57% of the AVID participants) and the percentage of Florida students meeting the ACT Math Benchmark as 36% in 2013 (as compared with 37% of the AVID participants in this study). Thus, the AVID participants exceeded those percentages in both cases. While the results of the study were restricted to the target district, a case could be made that the findings are applicable to the State of Florida as a whole based upon the similarity in demographics of the two populations and the similarity in students meeting the college readiness benchmark scores in English and Math.

Another limitation is inherent in the selection process used to enroll in the AVID program. Students must self-select and apply for admission to participate in AVID. Self-selection implies a certain level of motivation and academic interest. Not all students have an expectation of post-secondary education and their initial motivation levels may have been lower than the initial motivation levels of the AVID participants. Too, while the AVID program is designed to increase intrinsic motivation through increasing competence, autonomy, and relatedness, there is no way to guarantee that the initial levels of motivation were equal between the AVID participants and their non-AVID counterparts. Because the selection of non-AVID counterparts was random within the demographic profile groups, the assumption was made that some students may have greater initial motivation than the AVID participants and some may have lower initial motivation creating an average similar to the initial motivation of the AVID participants.

In order to reduce the risk due to the non-random selection of AVID participants, the AVID participants were matched to non-AVID counterparts on the basis of race, gender, grade

level, Title 1 status, and free lunch status (none of the AVID participants were reduced lunch status). The non-AVID matching school was the district school closest to the AVID demonstration school in student population, demographics, and socioeconomic status. However, the two schools are not identical and have their own unique school cultures. While the risk has been minimized as much as possible by matching AVID participants to their non-AVID counterparts, limitations still exist because the schools and the populations are not identical.

When analyzing data using an independent t test, two assumptions are made the first being that the populations approximate a normal curve and the second that there is equivalence of variance between the populations. A Shapiro-Wilks analysis to determine normality was done on all of the populations in the study and only the non-AVID ACT Math group had a W value lower than the critical value, indicating that the sample population was not normally distributed. Because the non-AVID ACT Math population was not normally distributed, analyzing the data with a non-parametric test reduced the risk of a Type 1 error. Consequently, in addition to the independent t test, a Mann Whitney U Test was done comparing the AVID ACT Math students to the non-AVID ACT Math students to reduce the risk of a Type 1 error.

To determine equivalence of variance Levene's Test for Equality of Variance was run comparing all of the AVID groups to their non-AVID counterparts. The AVID ACT Math group and the non-AVID ACT Math group did not have equivalence of variance [$p = .007$ ($p < 0.05$)]. However, because the sample populations of the two groups were equal, according to Adusah and Brooks (2011) the independent t test is robust enough to account for unequal variances when the sample populations have the same number of participants.

Implications of the Research

Florida has not identified or developed a statewide program to assist in raising the college

readiness of its high school graduates. Twenty-seven of Florida's school districts, particularly its larger school districts, have incorporated the AVID program in their middle schools, high schools, or both (Florida Department of Education, n.d.). The schools currently implementing AVID have teachers trained to use AVID strategies. Because a statistically significant difference in college readiness has been shown to exist between students enrolled in AVID and students never enrolled in AVID, Florida schools and school districts may choose to extend AVID strategies to a larger population of students beyond students who are currently benefiting from the program. While these findings are limited to only one school district within the state, the results were statistically significant for ACT Composite scores, ACT English scores, and ACT Math scores, which are the areas where most college remediation takes place.

Since the Bill and Melinda Gates Foundation initiated research by Dr. David L. Conley in 2007 to develop a model for college readiness (Conley, 2008a), states including Florida have sought to reduce the number of students taking remedial coursework in college. Bragg and Taylor (2014) indicate that the problem identified in 2007 continues to exist today:

For example, national data from ACT show that only one in four high school students are college ready in English, reading, mathematics, and science, according to ACT's college readiness benchmarks (ACT, 2012a)... ACT data are corroborated by evidence of student enrollment in developmental education at the postsecondary level. Data from the National Postsecondary Aid Study reported that approximately 20% of first-year undergraduate students participated in developmental education in 2007-2008 (Sparks & Malkus, 2013), and Complete College America (CCA; 2012) showed an even larger proportion of students participating in developmental course work. (p. 95)

States throughout the nation, including Florida, are seeking ways to reduce the number of students needing remedial coursework because of the expense of offering high school level coursework at college and university campuses. Tierney and Garcia (2011) describe this concern,

Many American high school graduates gain admission to 2- and 4-year postsecondary institutions only to find that they are not prepared for college-level work. As a result, the number of remedial courses in reading, writing, and mathematics has increased at postsecondary institutions. State governments and the broad public have questioned the efficacy of public postsecondary institutions spending money on classes that are remedial. Some in 2- and 4-year institutions also have balked at spending finite resources for non-college-level work. (p. 99)

As expressed by Tierney and Garcia (2011) the deficiencies in student preparation are primarily in reading, writing, and mathematics the areas tested by the specific *ACT College Readiness Benchmarks* for ACT English and ACT Math. Given the significance of the difference in ACT English and ACT Math scores for AVID participants versus students who never participated in AVID, the target school district may choose to extend the AVID program into all of its middle schools and high schools. They may also work to support the schools where AVID currently exists to strive to become AVID demonstration schools where AVID strategies are implemented with fidelity school-wide.

The State of Florida may also consider using AVID strategies to increase college readiness in students throughout the state. The results of this study also show that 57% of the AVID participants met the College Readiness Benchmark for English which is higher than the State of Florida average. As expressed by Tierney and Garcia (2011) “Regardless of one’s

position on the cost and effectiveness of such courses [remedial courses], one point is clear: Students are better off if they arrive at higher education's doorstep prepared for college-level work" (p. 99).

Theoretical Implications of the Research

Conley's (2010) Four Dimensions of College and Career Readiness include Key Cognitive Strategies, Key Content Knowledge, Academic Behaviors, and Contextual Skills and Awareness. Deci and Ryan's (2000) Self-Determination Theory predicts important academic and behavioral outcomes such as "psychological health and well-being, effective performance, creative problem solving, and deep conceptual learning" (p. 1). These outcomes include some of the key components of Conley's college readiness model such as effective performance, deep conceptual learning, (Key Content Knowledge) and creative problem-solving (Key Cognitive Strategies). Thus, increasing factors that impact self-determination may help schools increase the college readiness of their students.

AVID strategies increase student competence, student autonomy, and student relatedness, the three tenets of Deci and Ryan's (2000) Self-Determination Theory. This research study found that students who participated in the AVID program for three or more years scored higher on all three subtests of the *ACT College Readiness Benchmarks*, ACT Composite, ACT English, and ACT Math than students who never participated in the AVID program. These results indicate that AVID strategies that promote competence, autonomy, and relatedness also increase college readiness. The theoretical implications of this study are that incorporation of strategies that promote self-determination in students also increase college readiness in the students.

Recommendations for Future Research

The results of this study are limited to one school district in the State of Florida and to

extend the findings to the entire state a future study should identify AVID demonstration schools throughout the state to incorporate in the study. One of the unique qualities of the target school district is that the ACT College Readiness Benchmarks are administered to all of the 11th Grade students within the district. Many other school districts do not test their students and so *ACT College Readiness Benchmark* scores would only be available for those students who choose to take the test. It may be difficult to find districts with AVID demonstration schools that also administer the *ACT College Readiness Benchmarks* to all of their students. However, increasing the results of the research to additional school districts throughout the state would extend the findings beyond the target school district.

As other AVID high schools within the target school district have more experience implementing AVID strategies, a future study could be done comparing the *ACT College Readiness Benchmark* scores of the AVID participants with non-AVID students matched demographically. Some of the AVID high schools have brand new AVID coordinators and as the schools become more experienced at implementing AVID strategies they would be viable candidates for inclusion in a future study. Adding additional AVID schools would increase the rigor of the study by extending it beyond one school in the target school district.

This study limited a comparison of the difference in *ACT College Readiness Benchmarks* to the ACT Composite scores, ACT English scores, and the ACT Math scores. It would be valuable to compare the ACT Reading and ACT Science scores for AVID students versus non-AVID students to determine if differences would exist for those scores. The target school district has a traditionally strong science component to their curriculum and it would be valuable to determine if AVID students score higher on the ACT Science test than non-AVID students.

The target school district implements the AVID program in many of the feeder middle

schools including the feeder school to the AVID demonstration school used in this study. It would be interesting to investigate if there are statistically significant differences between students who have participated in AVID in middle school and high school compared to students who only participated in AVID in high school.

Conclusion

The college readiness of high school students continues to be a problem in 2014 (Bragg & Taylor, 2014). States are continuing to seek solutions that will adequately prepare their high school students to be successful in college level coursework without the need for remedial courses (Sparks & Malkus, 2013). The results of this study indicate that incorporating AVID strategies may provide a solution to creating college readiness in students. Students enrolled in the AVID program for three or more years had significantly higher *ACT College Readiness Benchmarks* for ACT Composite scores, ACT English scores, and ACT Math scores than students who never participated in the AVID program. Based upon these results, the case can be made that AVID strategies which promote competence, autonomy, and relatedness increase the college readiness of students, particularly minority students. This leads to the supposition that exposing all students to AVID strategies could increase their college readiness and reduce the amount of remedial instruction necessary to prepare them to be successful in college coursework. Florida and other states may consider increasing student access to the AVID program by increasing the number of schools offering AVID electives. They may also consider incorporating AVID strategies for all students. Research by Conley and French (2014) indicate that one of the non-academic components to college readiness is student ownership of learning. The strategies incorporated in the AVID program are designed to promote student ownership of learning and thus may be one of the reasons that AVID students had significantly higher *ACT*

College Readiness Benchmark scores for ACT Composite, ACT English, and ACT Math than non-AVID students. The results of this study indicate that exposing students to AVID strategies may provide a solution to the college readiness dilemma facing the target school district and the State of Florida.

REFERENCES

- Achieve (n.d.) *Summits*. Retrieved from www.achieve.org/summits
- The ACT. (2014). *Act Profile Report--State: Graduating Class 2014 Florida*. Retrieved from www.act.org/newsroom/data/2014/pdf/profile/Florida.pdf
- The ACT. (n.d.). *Technical manual*. Retrieved from http://www.act.org/aap/pdf/ACT_Technical_Manual.pdf
- Adusah, A. K., & Brooks, G. P. (2011). Type 1 error inflation of the separate-variances Welch t test with very small sample sizes when assumptions are met. *Applied Statistical Methods, 10*(1), 362-372.
- Allen, J., & Scoring, J. (2005). *Using ACT Assessment scores to set benchmarks for college readiness* (ACT Research Report No. 2005-3). Iowa City, IA: ACT.
- Arslan, A. (2013). Investigation of relationship between sources of self-efficacy beliefs of secondary school students and some variables. *Educational Consultancy and Research Center, 13*(4), 1983-1993. doi: 10:12738/espt.2013.4.1753
- AVID. (n.d.). Retrieved from <http://www.avid.org>
- Black, A. C., Little, C. A., & McCoach, D. B. (2008). Advancement via individual determination: Method selection in conclusion about program effectiveness. *The Journal of Educational Research, 102*(2), 111-124.
- Bortoli, L., Bertollo, M., Comani, S., & Rabazza, C. (2011). Competence, achievement goals, motivational climate, and pleasant psychobiosocial states in youth sport, *Journal of Sports Sciences, 29*(2), 171-180.
- Bragg, D., & Taylor, J. L. (2014). Toward college and career readiness: How different models produce similar short-term outcomes. *American Behavioral Scientist, 58*(9), 994-1017.

- Bray, J. H., & Maxwell, S. E. (1985). *Multivariate analysis of variance*. Newbury Park, CA: Sage Publications, Inc.
- Cline, Z., Bissell, J., Hafner, A., & Katz, M. (2007). Closing the college readiness gap. *Leadership, 37*(2), 30-33.
- Cohen, J. (1992). Quantitative methods in psychology. *Psychological Bulletin, 112*(1), 155-159.
- Conley, D. T. (2008a). Rethinking college readiness. *New Directions for Higher Education, 144*(3), 3-13.
- Conley, D. T. (2008b). Rethinking college readiness. *New England Board of Higher Education, 22*(5), 24-26.
- Conley, D. T., & French, E. M. (2014). Student ownership of learning as a key component of college readiness. *American Behavioral Scientist, 58*(8), 1018-1034.
- Conley, D. T., McGaughy, C. L., Kirtner, J., Vander Valk, A., & Martinez-Wenzel, M. (2010, April). *College readiness practices at 38 high schools and the development of the CollegeCareerReady School Diagnostic Tool. Paper presented at the annual conference of the American Educational Research Association, Denver, CO.*
- Contreras, F. (2011). Strengthening the bridge to higher education for academically promised underrepresented students. *Journal of Advanced Academics, 22*(3), 500-526.
- Deci, E., & Ryan, R. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*(1), 68-78.
- DiPrete, T., & Buchman, C. (2006). Gender-specific trends in the value of education and emerging gender gap in college completion. *Demography 2006, 43*, 1-24.
- Dougherty, C. (2010). *Using the right data to determine if high school interventions are working to prepare students for college and careers*. Retrieved from National

High School Center website:

<http://eric.ed.gov/?q=Dougherty%2c+C.+%282010%29+Using+the+right+data+to+determine+if+high+school+interventions+are+&id=ED511823>

Ensor, K. L. (2009). Improving developmental college counseling programs. *Journal of College Admission*, 205(1), 16-21.

Ewert, S. (2012). Fewer diplomas for men: The influence of college experiences on the gender gap in college graduation. *The Journal of Higher Education*, 83(6), 824-850.

Fitzgerald, K., Gordon, T., Onwuegbuzic, A. J., Canty, A., Stitt, R., & Frels, R. K. (2013). Ethnic differences in completion rates as a function of schools size in Texas high schools. *The Journal of AT-RISK ISSUES*, 17(2), 1-10.

Florida Department of Education. (n.d.). Retrieved from <https://www.fldoe.org/schools/pdf/avidcontact.pdf>

Florida Department of Education. (2014). *2013-2014 Membership Report (2013-14 Survey 3 Data)*. Tallahassee, FL: Florida Department of Education.

French, A., Macedo, M., Poulsen, J., Waterson, T., & Yu, A. (n.d.). Multivariate Analysis of Variance (MANOVA). Retrieved from <http://online.sfsu.edu/efc/classes/biol710/manova/MANOVAnewest.pdf>

Gall, M. D., Gall, J. P., & Borg, W. R. (2010). *Educational research*. Boston, MA: Pearson.

Gewertz, C. (2010). For high-risk groups, success gap hinges on readiness, *Education Week*, 30(7), 8.

Gewertz, C. (2011). More students meet ACT's college-readiness benchmarks. *Education Week*, 31(1), 8.

- Goldstein, A. (2001). The upgrader. *Time*, 158(12), 84.
- Guay, F., Ratelle, C., & Chanal, J. (2008). Optimal learning in optimal contexts: The role of self-determination in education. *Canadian Psychology*, 49(3), 233-240.
- Haycock, K. (2010). Building common college-ready standards. *Change*, 42(4), 14-19.
- Howell, D. C. (2008). *Fundamental Statistics for the Behavioral Sciences*. Belmont, CA: Thomson Wadsworth.
- Huber, J. C., & Wagner-Döbler, R. (2003). Using the Mann-Whitney test on informetric data. *Journal of the American Society for Information Technology*, 54(8), 798-801. doi: 10.1002/asi.10252
- Huerta, J., Watt, K., & Alkan, E. (2008). Exploring the relationship between AVID professional development and teacher leadership. *Academic Leadership Live*, 6(1), 1-7.
- Huerta, J., Watt, K., & Butcher, J. (2013). Examining Advancement Via Individual Determination (AVID) and its impact on middle school rigor and student preparedness. *American Secondary Education*, 41(2), 24-37.
- Johnson, D., Nickel, P., Popp J., & Marcus, M. (2011). Validation of the AVID Certification Self Study (CSS): A measure of AVID secondary program implementation fidelity. Unpublished paper. Retrieved on July 29, 2013 from http://www.avid.org/dl/res_research/research_validationoftheavidcss.pdf .
- Kitsantas, A., & Zimmerman, B. (2009). College students' homework and academic achievement: The mediating role of self-regulating beliefs. *Metacognition & Learning*, 4(2), 97-110.
- Kuh, G. (2007). What student engagement data tell us about college readiness. *Peer Review*, 9(1), 4-8.

- Lozano, A., Watt, K. M., & Huerta, J. (2009). A comparison study of 12th grade Hispanic students. *American Secondary Education*, 38(1), 92-110.
- Lowry, R. (1999-2013). VassarStats: Statistical computation web site. Retrieved from <http://vassarstats.net/textbook/ch11/pt1.html>
- Mendiola, I. D., Watt, K., Huerta, J. (2010) The impact of Advancement Via Individual Determination (AVID) on Mexican American students enrolled in a 4-year University. *Journal of Hispanic Higher Education*, 9(3), 209-220. doi: 10.1177/1538192710368313
- Moore, K., Redd, Z., Burkhauser, M., Mbwana, K., & Collins, A. (2011). Children in poverty. *Childhood Education*, 11, 1-12.
- Moran, K. (2008). Examining the mathematical preparedness of first year students entering college directly from traditional high schools in Connecticut, *Research & Teaching in Developmental Education*, 25(1), 30-44.
- National Survey of Student Engagement [NSSE]. (n.d.). Retrieved from http://nsse.iub.edu/html/annual_results.cfm
- Nelson, J. (2007). AVIDly seeking success. *Educational Leadership*, 64(7), 72-74.
- New Mexico Public Education Department. (2010). *A world class education: Strategic plan, 2010-2015*(ED514490). Retrieved from <http://www.ped.state.nm.us/sec.of.ed/2010-2015%20Strategic%20Plan%20V.2.0.pdf>
- NIST/SEMATECH *e-Handbook of Statistical Methods* (2003). Retrieved from <http://www.itl.nist.gov/div898/handbook/eda/section3/eda35a.htm>
- Pettit, M., & Prince, D. (2010). Washington State's student achievement initiative. *Journal of Applied Research in the Community College*, 17(2), 6-12.

- Roderick, M., Nagaoka, J., & Coca, V. (2009). College readiness for all: The challenge for urban high schools. *Future of Children, 19*(1), 185-210.
- Ryan, R. M., & Deci, E. L. (2008). A Self-Determination Theory approach to psychotherapy: The motivational basis for effective change. *Canadian Psychological Association, 49*(3), 186-193. doi: 10: 1037/a0012753
- Skelly, K. A. (2011). Tracking college readiness. *School Administrator, 68*(6), 32-36.
- Soric, I. (2009). Regulatory styles, causal attributions, and academic achievement. *School Psychology International, 30*(4), 403-420.
- Sparks, D., & Malkus, N. (2013, January). *First-year undergraduate remedial course-taking: 1999-2000, 2003-04, 2007-08 (NCES 2012-2013)*. Washington, DC: National Center for Education Statistics. Retrieved from <http://nces.ed.gov/pubs2013/2013013.pdf>
- Spence, D. (2009). State college readiness initiatives and community colleges. *New Directions for Community Colleges, 145*(1), 95-101. doi: 10.1002/cc.358
- Swanson, M. C. (1989). Advancement via individual determination: Project AVID. *Educational Leadership, 46*(5), 63-65.
- Swanson, M. C. (1996). AVID learners. *Thrust for Educational Leadership, 26*(1), 24-28.
- Swanson, M. C. (2000). Rigor with support: Lessons from AVID. *Leadership, 30*(2), 26-30.
- Tabachnick, B. G., & Fidell, L.S. (2013). *Using multivariate statistics* (6th ed.). Boston: Pearson Education.
- Tierney, W. G., & Garcia, L. D. (2011). Postsecondary remediation, interventions, and policies. *American Behavioral Scientist, 55*(2), 99-101.
- Van Ryzin, M. J., Gravely, A. A., & Roseth, C. J. (2009). Autonomy, belongingness, and

- engagement in school as contributors to adolescent psychological well-being.
Journal of Youth & Adolescence, 38(1), 1-12. doi: 10.1007/s10964-007-9257-4
- Van Voorhis, C., & Morgan, B. (2007). Understanding power and rules of thumb for determining sample sizes. *Tutorials in Quantitative Methods in Psychology*, 3(2), 43-50.
- Watt, K. M., Huerta, J. J., & Alkan, E. (2011). Identifying predictors of college success through an examination of AVID graduates' college preparatory achievements. *Journal of Hispanic Higher Education*, 10(2), 120-133. doi: 10.1177/1538192711402353
- Watt, K., Huerta, J., & Lozano, A. (2007). A comparison study of AVID and GEAR UP 10th-grade students in two high schools in the Rio Grande Valley of Texas. *Journal of Education for Students Placed at Risk*, 12(2), 185-212.
- Watt, K. M., Huerta, J., & Mills, S. J. (2010). Advancement Via Individual Determination (AVID) professional development as a predictor of teacher leadership in the United States, *Professional Development in Education*, 36(4), 547-562. doi: 10.1080/19415250903430122
- Watt, K. M., Johnston, D., Huerta, J., Mendiola, I. D., & Alkan, E. (2008). Retention of first-generation college-going seniors in the college preparatory program AVID. *American Secondary Education*, 37(1), 17-40.
- Watt, K. M., Mills, S. J., & Huerta, J. (2010). The impact of Advancement Via Individual Determination (AVID) professional development on teacher perceptions of school culture and climate in the United States. *Journal of Educational Reform*, 19(3), 172-184.
- Watt, K. M., Powell, C. A., Mendiola, I. D., & Cossio, G. (2006). School wide impact and AVID: How have selected schools addressed the new accountability

measures? *Journal of Education for Students Placed at Risk*, 11(1), 57-73.

Yen C., & Lui, S. (2009). Learner autonomy as a predictor of course success and final grades in community college online courses. *Journal of Educational Computing Research*, 41(3), 347-367.

Zelkowski, J. (2010). Secondary mathematics: Four credits, block schedules, continuous enrollment? What maximizes college readiness? *The Mathematics Educator*, 20(1), 8-21.

APPENDIX A

11th Grade Student Matching Data Resource

Table 5

11th Grade AVID and Non-AVID Matching Data

| St. # | Race | G | Title 1 | Free | A C | A E | A M | NA C | NA E | NA M | Match Data |
|-------|-------|---|---------|------|-----|-----|-----|------|------|------|------------|
| 1 | C | M | Yes | No | 17 | 16 | 18 | 18 | 18 | 19 | #5/8 |
| 2 | H | M | Yes | No | 24 | 22 | 25 | 18 | 18 | 16 | #1/3 |
| 3 | MR | F | No | No | 25 | 24 | 23 | 17 | 17 | 18 | #1/1 |
| 4 | C | F | No | No | 14 | 12 | 16 | 18 | 18 | 19 | #37/59 |
| 5 | A | M | No | No | 26 | 24 | 29 | 18 | 17 | 18 | #1/1 |
| 6 | C | F | No | No | 21 | 20 | 19 | 20 | 21 | 18 | #54/59 |
| 7 | C | F | No | No | 17 | 14 | 17 | 17 | 16 | 16 | #50/59 |
| 8 | AA | M | No | No | 17 | 14 | 15 | 18 | 17 | 16 | #3/13 |
| 9 | MR/AA | M | No | No | 22 | 23 | 23 | 16 | 16 | 16 | #2/13 |
| 10 | C | F | Yes | No | 15 | 9 | 13 | 18 | 14 | 19 | #9/9 |
| 11 | MR/H | M | No | No | 22 | 16 | 24 | 13 | 8 | 15 | #1/8 |
| 12 | C | F | No | Yes | 25 | 24 | 25 | 20 | 22 | 22 | #18/24 |
| 13 | C | F | No | No | 19 | 20 | 20 | 16 | 17 | 15 | #31/59 |
| 14 | H | F | Yes | No | 16 | 16 | 16 | | | | NM |
| 15 | C | M | No | No | 24 | 23 | 24 | 24 | 24 | 23 | #51/63 |
| 16 | MR/H | M | No | No | 22 | 21 | 25 | 22 | 22 | 23 | #3/8 |
| 17 | AA | M | Yes | No | 17 | 14 | 19 | 21 | 20 | 21 | #2/2 |
| 18 | AA | M | Yes | Yes | 15 | 11 | 15 | 16 | 17 | 17 | #4/5 |
| 19 | H | F | No | Yes | 17 | 13 | 16 | 19 | 16 | 17 | #2/9 |
| 20 | C | F | No | No | 19 | 12 | 23 | 21 | 20 | 23 | #22/59 |
| 21 | AA | F | Yes | Yes | 19 | 16 | 19 | 17 | 18 | 17 | #3/6 |
| 22 | C | F | No | No | 19 | 14 | 17 | 13 | 11 | 17 | #45/59 |
| 23 | C | F | No | No | 26 | 28 | 27 | 24 | 21 | 26 | #30/59 |
| 24 | C | F | No | No | 20 | 19 | 19 | 21 | 20 | 20 | #7/59 |
| 25 | C | F | No | No | 19 | 20 | 19 | 15 | 18 | 17 | #3/59 |
| 26 | C | M | No | No | 22 | 20 | 21 | 20 | 20 | 21 | #59/63 |
| 27 | C | M | No | Yes | 18 | 18 | 17 | 14 | 12 | 17 | #20/29 |
| 28 | C | F | No | No | 21 | 18 | 22 | 15 | 15 | 16 | #10/59 |
| 29 | C | M | No | No | 21 | 17 | 25 | 16 | 11 | 19 | #37/63 |
| 30 | H | M | Yes | No | 23 | 23 | 23 | 24 | 22 | 27 | #2/3 |
| 31 | C | F | No | No | 21 | 20 | 23 | 21 | 21 | 23 | #13/59 |
| 32 | AA | F | No | Yes | 25 | 24 | 24 | 16 | 18 | 16 | #1/20 |
| 33 | H | M | No | No | 19 | 17 | 19 | 21 | 21 | 19 | #8/8 |
| 34 | H | F | Yes | No | 20 | 19 | 17 | 21 | 21 | 19 | #1/1 |
| 35 | AA | M | Yes | Yes | 13 | 11 | 15 | 14 | 13 | 16 | #2/5 |
| 36 | H | M | No | No | 23 | 23 | 21 | 14 | 12 | 16 | #2/8 |
| 37 | AA | F | No | No | 18 | 19 | 18 | 15 | 14 | 16 | #13/14 |

| | | | | | | | | | | | |
|----|-------|---|-----|----|----|----|----|----|----|----|--------|
| 38 | AA | F | Yes | No | 18 | 21 | 17 | 18 | 17 | 16 | #16/20 |
| 39 | C | F | Yes | No | 23 | 23 | 24 | 20 | 21 | 17 | #6/9 |
| 40 | MR/AA | M | Yes | No | 16 | 15 | 15 | | | | NM |
| 41 | C | F | No | No | 26 | 31 | 23 | 17 | 18 | 16 | #57/59 |
| 42 | MR/AA | M | Yes | No | 17 | 16 | 16 | | | | NM |
| 43 | MR/AA | F | No | No | 17 | 15 | 16 | 18 | 16 | 19 | #8/14 |
| 44 | C | M | No | No | 25 | 23 | 24 | 27 | 28 | 26 | #1/63 |
| 45 | C | M | No | No | 22 | 26 | 19 | 17 | 13 | 16 | #19/63 |
| 46 | C | M | No | No | 16 | 17 | 15 | 18 | 17 | 15 | #5/63 |
| 47 | AA | M | No | No | 21 | 21 | 21 | 15 | 13 | 16 | #11/13 |
| 48 | MR/AA | F | No | No | 17 | 18 | 16 | 17 | 16 | 17 | #6/14 |

Note. St. # = Student number, G = Gender, Free = Free Lunch, A C = AVID ACT Composite scores, A E = AVID ACT English scores, A M = AVID ACT Math scores, NA C = Non-AVID ACT Composite scores, NA E = Non-AVID ACT English scores, NA M = Non-AVID ACT Math Scores

*AA=African-American, A=Asian, C=Caucasian, H=Hispanic, MR=Mixed Race, NM = No Match

APPENDIX B

12th Grade Student Matching Data Resource

Table 6

12th Grade AVID and Non-AVID Matching Data

| St. # | Race | G | Title 1 | Free | A C | A E | A M | NA C | NA E | NA M | Match Data |
|-------|------|---|---------|------|-----|-----|-----|------|------|------|------------|
| 49 | MR | F | No | Yes | 19 | 22 | 16 | 17 | 18 | 18 | #3/4 |
| 50 | H | F | No | Yes | 21 | 21 | 22 | 15 | 14 | 15 | #3/9 |
| 51 | AA | F | No | No | 18 | 16 | 20 | 19 | 18 | 19 | #14/14 |
| 52 | C | M | Yes | No | 25 | 26 | 27 | 23 | 23 | 23 | #2/7 |
| 53 | H | F | Yes | Yes | 14 | 10 | 15 | 21 | 23 | 18 | #2/2 |
| 54 | H | F | No | Yes | 17 | 17 | 15 | 15 | 10 | 13 | #4/9 |
| 55 | AA | F | No | No | 19 | 18 | 15 | 17 | 16 | 16 | #2/14 |
| 56 | H | M | No | No | 13 | 14 | 14 | 19 | 13 | 22 | #8/12 |
| 57 | AA | M | No | Yes | 22 | 20 | 23 | 14 | 11 | 16 | #24/26 |
| 58 | AA | M | No | No | 17 | 17 | 17 | 16 | 15 | 19 | #2/10 |
| 59 | AA | M | No | No | 17 | 17 | 17 | 15 | 12 | 14 | #9/10 |
| 60 | MR | F | No | Yes | 20 | 19 | 17 | 20 | 22 | 18 | #1/4 |
| 61 | H | M | No | Yes | 16 | 13 | 16 | 17 | 17 | 17 | #7/9 |
| 62 | H | F | No | Yes | 18 | 16 | 19 | 18 | 15 | 16 | #8/9 |
| 63 | C | F | No | No | 22 | 20 | 23 | 16 | 13 | 16 | #23/64 |
| 64 | AA | M | Yes | Yes | 21 | 20 | 22 | 16 | 13 | 16 | #3/8 |
| 65 | AA | F | Yes | Yes | 17 | 17 | 17 | 15 | 15 | 15 | #1/2 |
| 66 | AA | F | No | Yes | 18 | 15 | 17 | 17 | 15 | 17 | #11/13 |

Note. St. # = Student number, G = Gender, Free = Free Lunch, A C = AVID ACT Composite scores, A E = AVID ACT English scores, A M = AVID ACT Math scores, NA C = Non-AVID ACT Composite scores, NA E = Non-AVID ACT English scores, NA M = Non-AVID ACT Math Scores

*AA=African-American, A=Asian, C=Caucasian, H=Hispanic, MR=Mixed Race, NM = No Match