EARLY COLLEGE ACADEMIC PERFORMANCE: STUDYING THE EFFECTS OF EARNING COLLEGE CREDITS FROM ADVANCED PLACEMENT AND DUAL ENROLLMENT

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by
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ABSTRACT

Early College Academic Performance: Studying the Effects of Earning College Credits from Advanced Placement and Dual Enrollment
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This quantitative study examined the impact of Advanced Placement (AP) and Dual Enrollment (DE) on early college academic performance by analyzing and comparing first year and sophomore year persistence rates and grade point averages (GPAs) of four student cohorts who began their education at a large urban research I university in fall 2007. These cohorts of fall 2007 first year and first time college admits comprise students who earned college credits in high school by participation in Credit Based Transition Programs (CBTPs), specifically AP and DE, and students who did not earn college credits during high school. This study has contributed to literature examining the relationship between earning college credits in high school and early college academic performance.

CBTPs were created for the benefit of high school students and the K-16 educational system. These programs were specifically created and implemented to introduce students to the rigors of college and ease the academic and social transition from high school to college. Student AP and DE participation increases yearly (*The Fifth Annual,* 2009; Kleiner & Lewis, 2005) and the first year of college is pivotal in terms of student retention (Astin, 1984; Bailey & Karp, 2003; Bailey, Hughes, & Karp, 2002; Cohen & Brawer, 1996; Coomes & Debard, 2004; Klekotka, 2005; Kuh, 2005; Light,

2001; Pascarella & Terenzini, 2005; Plucker, Chien, & Zaman, 2006; Tinto, 1987). These are the two primary impetuses for studying this phenomenon.

This study utilized multiple chi-square, Pearson correlation, multiple regression, oneway ANOVA, and ANCOVA statistical analyses. These analyses provided ample data for answering the research questions. The sample comprised four cohorts of first year, first time college, students entering a large urban research institution in fall 2007: 1) students entering with only Advanced Placement (AP) credits ("AP" cohort), 2) students entering with only Dual Enrollment (DE) credits ("DE" cohort), 3) students entering with both AP and DE credits ("AP and DE" cohort), and 4) students entering with no college credits ("Non AP and/or DE" cohort). Statistical analyses presented results showing no statistically significant difference in early college academic performance amongst the cohorts in the study.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1
INTRODUCTION

Seven main components of this introduction will assist the reader in fully understanding the purposes and foci of this research study. Each section builds on the previous, providing a transparent and linear approach to understanding this study. For this reason, sections are comprehensive and communicate the depth and breadth of the research. The main components are as follows: 1) statement of the problem, 2) purpose of the study, 3) research questions, 4) definitions, 5) delimitations and limitations of the study, 6) significance of the study, and 7) theoretical base.

The statement of the problem conveys the societal phenomenon of the bifurcation of first year college students into a cohort entering college with college credits earned in high school and a cohort entering college without college credits earned in high school. This section continues by addressing two salient factors (i.e., CBTPs and the transition to college) surrounding these cohorts. The purpose of the study section illustrates precisely what this study accomplished and how this research complements gaps in the current literature. Research questions identify the core problems addressed in this study. The definition section highlights and defines literature specific terminology found throughout this dissertation. Delimitations and limitations present information regarding how this study was typical and atypical of similar studies and identify the logistical parameters encountered during study. The significance of the study contextualizes the research and explains why this phenomenon is being studied, as well as why this phenomenon is important. Lastly, the theoretical base frames the study on a larger scale.

Statement of the Problem

Hundreds of thousands of high school students earn college credits by participating in AP and DE experiences aimed to ease the transition from high school to college (*The Fifth Annual,* 2009; Kleiner & Lewis, 2005). Research studies examining the effects earning college credits prior to college has on early college academic achievement have disparate outcomes (Casserly, 1986; Curry et al., 1999; Hargrove et al., 2008; Morgan & Crone, 1993; Morgan & Klaric, 2007; 1993; Morgan & Ramist, 1998; Sadler & Tai, 2007; Simms, 1982; Willingham & Morris; 1986). However, AP and DE experiences were created and implemented specifically to ease the transition from high school to college. Creators of the programs were motivated in part by the importance of the first year of college. The following section discusses these aforementioned components in greater detail, providing a clearer understanding of this problem.

Students participate in AP and DE for a number of reasons. One of the ideal outcomes of AP and DE participation is to receive college credits. Perhaps this is one reason why the number of high school students participating in these experiences increases each year. Another reason for AP and DE participation is that certain students may desire a more challenging curriculum during high school. Third, students may desire to have the record of AP of DE experiences appear on their high school transcript solely to enhance their standing as a high quality prospective college student in the eyes of admissions offices. There are also federal and state laws coercing high schools to implement these programs because it is believed AP and DE lead to a more academically

prepared college student. All these reasons, and more, contribute to the fact that US high schools teem with students who participate in and receive credit from AP and DE.

Popular public opinion has equated the ability to receive college credit in high school with the ability to perform well in subsequent years of college. This relationship would seem to be axiomatic. Review of the literature identifies disparate research results and supports the argument that the aforementioned perception of AP and DE is not necessarily true and must be studied more intently and extensively. Further study will assist in illustrating the effects of earning college credit via AP and DE on early college academic performance.

Contrasting research outcomes regarding the effects of AP and DE might astonish some individuals. Surprise may occur because these programs were designed explicitly to ease the transition from high school to college and people expect the programs are successful because of high levels of participation. If the programs are not easing the transition from high school to college then they are not accomplishing a primary programmatic outcome. This statement of the problem identifies and illuminates a major thrust throughout the literature (Casserly, 1986; Curry et al., 1999; Hargrove et al., 2008; Morgan & Crone, 1993; Morgan & Klaric, 2007; 1993; Morgan & Ramist, 1998; Sadler & Tai, 2007; Simms, 1982; Willingham & Morris; 1986).

The problem increases in scale and importance when considering the fact that student attrition is most prolific in the first year of college. Policy makers, educational administrators, students, and parents need to know if these programs actually assist the academic transition to college. Constituents should desire, and deserve, to know if these

programs enhance the likelihood of first year retention and/or increase first semester, second semester, third semester, and cumulative GPA. Considering the accelerating rate of participation, studies (Klopfenstein & Thomas 2006; Rust, 2007; Sadler & Tai, 2007) demonstrating that AP and DE do not accomplish the primary goal of easing the academic transition to college are disheartening and disappointing.

Purpose of the Study

There were several purposes for this study. Each will be briefly introduced and discussed in this section. First, this study examined the effects that earning college credit prior to college has on early college performance. Furthermore, this study compared the academic progress of AP students and DE students to each other and to a cohort of students who did not earn college credits from AP and/or DE. The study considered several variables that represent prior academic history (i.e., high school GPA, SAT Math score, SAT Verbal score, and SAT Total score) and socioeconomic status (i.e., parent's level of education and parent's income). This research fills gaps in the literature by disaggregating and comparing both AP and DE, and by controlling for prior academic history and socioeconomic status, all factors that have been researched only minimally.

Beyond identifying early college academic achievement, this study compared the performance of each cohort. Specifically, this study examined whether the AP cohort outperformed other cohorts (i.e., DE cohort and students entering with zero college credits). These results provided data needed to make sound judgments and insight for answering the research questions.

Including prior academic history and socioeconomic status variables provided a more comprehensive answer to the research questions. Controlling for these variables in the analyses increased the validity of the results by removing the effects these external forces and variables may have on college student achievement. As previously stated, controlling for these factors created an excellent opportunity to contribute to the gaps in current literature about this phenomenon. The literature review section clearly communicates the intentions and results of research preceding this current study and identifies the need for more research that considers and includes specific external variables such as prior academic history and socioeconomic status.

Last, this study identifies which types of students are more likely to enter this institution with college credits earned from AP and/or DE participation. The study answers questions such as: Are these students predominantly one gender? What is the racial breakdown of this cohort? Do these students have higher SAT Math, Sat Verbal, and SAT Total scores? Do these students have higher high school grade point averages? Answers to these questions could be important for educational administrators creating and implementing programs for first year students.

Research Questions

There are three major research questions. Initially, this study answered the question: does earning college credits by participating in AP or DE affect first and second year retention? The second major research question is as follows: does earning college credits prior to college affect early academic achievement, as reflected in the first, second, and third semester GPAs? The last major question answered during this study

was: does earning college credits by participating in AP or DE affect early academic achievement in the first, second, and third semester GPAs when controlling for other variables such as high school GPA and family income?

The first and second questions are fairly basic when compared to the third major research question. The first and second questions revealed any effect earning college credits from AP or DE has on early college academic performance. These are the general questions that produced results regarding what, if any impact, these experiences have on first year retention and/or GPA. Answering these initial research questions provided the framework for the more detailed question.

The third research question provided greater detail regarding outcomes associated with earning college credits from AP and DE experiences. The analyses measured the effect of earning credits from AP and DE while controlling for several external variables that may impact early college academic performance. Answering this question also assisted with providing data on which cohort of students is more likely to enter this particular college with college credits earned from AP or DE experiences.

Definitions

1) Early college academic performance/achievement – first semester GPA, second semester GPA, third semester GPA, and/or cumulative GPA of the first three semesters or retention during the first four semesters

2) First year student – traditional first year, first time college, student entering college in fall 2007

3) Credit Based Transition Programs (CBTPs) (Bailey, Hughes, & Karp, 2003; Klekotka, 2005; Plucker, et al., 2006)
    a) Singleton Programs
        i) Advanced Placement (AP)
        ii) Dual Enrollment, Dual Enrollment and Dual Credit, and Concurrent Enrollment (DE, DE and DC, and CE)
    b) Comprehensive Programs
        i) International Baccalaureate (IB)
        ii) Tech Prep
    c) Enhanced Comprehensive Programs
        i) Middle College High School (MCHS)/Early College High School (ECHS)

Delimitations and Limitations

This study has certain demarcations and limitations worth noting. First, this research focuses on one institution. Second, the population consists of entering students from a single fall class. The scope of this study is to assess early college academic performance as it has been operationalized in the definitions section. Academic performance is analyzed through the third semester. Institutional data gathered does not differentiate between students who earned college credits by participating in Dual Enrollment (DE) versus students who accumulated college credits because of participation in Dual Enrollment and Dual Credit (DE and DC) programs. The dataset

utilized was also unable to disaggregate the specific type of DE experience. Also related to disaggregation, the cohort of students who earned credits from both AP and DE experiences (i.e., "AP and DE" group) was too small to include in any statistical analyses. Furthermore, 18 of the 32 AP examinations accepted at the studied institution require a minimum score of a three to receive college credits. It is important to note that in some instances at the studied institution, the same AP examination is not evaluated the same for different exam scores. In other words, a three might receive a certain number of credits and level of placement while a five would receive a different number of credits and a higher placement.

This study contributes to the current body of literature regarding this phenomenon. However, it is important to note the size and scope of the sample. This sample comprised students at one large urban research institution. Specifically, these students all entered during the same year (i.e., fall 2007). Another characteristic of this sample is that these students were all first time in college students. This study did not include transfer students from other four year or two year institutions. As transparently communicated, the sample is specific. Therefore, results of this study should not be utilized to make broad generalizations of the population of all students entering college with college credits earned from AP or DE because, as previously stated, this sample explicitly excludes and includes certain factors that impact statistical analyses.

The second delimitation of this study is the sole assessment of academic achievement through the third semester. This study did not address academic performance after the first semester of the sophomore year. Furthermore, this research

does not examine students' perceptions of college readiness after AP and/or DE participation. The scope of this study did not include measuring the level and impact of student motivation. Similarly, this study does not aim to assess the effects AP and/or DE participation may have on the social transition to college. These factors are being acknowledged because all could play a role in student academic outcomes (Klopfenstein & Thomas, 2006). However, this study did not attempt to address these valid research variables. The aforementioned variables could provide a solid base for follow up studies.

Dissimilar from the demarcations selected, this study has limitations imposed due to the nature of the programs studied. DE is different than DE/DC. DE is an experience where a high school student is enrolled in high school courses and college courses at the same time. These students receive college credits for the DE experience, provided the grade is adequate. The DE experience does not stem from an established agreement between a high school and college. DE/DC involves high school students participating in a college level course and receiving both credit for college and credit towards their high school curriculum requirements. Therefore, not all DE experiences are DE/DC experiences. The institution providing data for this research does not differentiate between DE and DE/DC. It is likely this practice is common among institutions of higher education. It would take an integrated system of coding and tracking to effectively differentiate between DE and DE/DC. If high school students are taking college level course while enrolled in high school then they are still involved in a DE experience and it does not matter whether or not they receive high school credit. However, these nuances

are considered to be a limitation of the study and future studies should strive to assess both DE and DE/DC.

The second limitation involving DE also involves tracking. Tracking, as noted in the DE section of the literature review, is an issue needing attention. Identifying which DE experience a student participates in is virtually impossible. DE takes several programmatic shapes when implemented. The college course can be offered at a college campus by a college professor, offered at a high school and taught by a certified high school instructor, or offered at a high school and instructed by a professor from the college where the DE contract has been executed. Alternatively, the course could be held on-line. The lack of national tracking and consistency of DE programs were driving forces behind the lack of disaggregation of the DE cohort in this study. This is unfortunate because internal and external constituents truly need to know what effects each separate program has on college performance.

Significance of the Study

The majority of students who leave college have a higher rate of departure during the first year (Pascarella & Terenzini, 2005; Plucker et al., 2006; Tinto, 1987). Colleges focus monumental amounts of energy on initiatives and programs designed to retain first year students (Tinto, 1987). Federal and state governments are also emphasizing changing the structure of education so students are better prepared to enter and complete college. CBTPs, supported by the government and higher education, are focused on preparing students for college and assisting with the first year transition to college (Bailey et al., 2002; Bailey & Karp, 2003; Plucker et al., 2006). For this reason, ethical

educational administrators and external constituents should exhibit due diligence and further examine the effectiveness of CBTPs.

CBTPs comprise three categories: singleton programs, comprehensive programs and enhanced comprehensive programs (Bailey et al., 2002; Bailey & Karp, 2003; Plucker et al., 2006). Singleton programs are traditionally geared toward high achieving, highly motivated, and/or economically advantaged students. This cohort of programs consists of Advanced Placement (AP), Dual Enrollment (DE), and Dual Enrollment/Dual Credit (DE/DC) initiatives. Comprehensive programs consist of International Baccalaureate (IB) and tech prep. Comprehensive programs have established curricular goals that students must satisfy and offer more social support than singleton programs. These programs can, and often times do, fulfill the same requirements as a traditional high school curriculum. Enhanced comprehensive programs offer the most academic and social support and are typically geared toward students who have not displayed academic excellence and/or are underrepresented and underserved in secondary and postsecondary educational settings. This third category comprises Middle College High Schools (MCHSs) and Early College High Schools (ECHSs).

The College Board (2007) reports a large increase in the number of students participating in AP classes and the number of AP examinations administered between 1987 and 2007. Figure 1 illustrates AP participation from 1987-2007 (*Annual AP*, 2007).

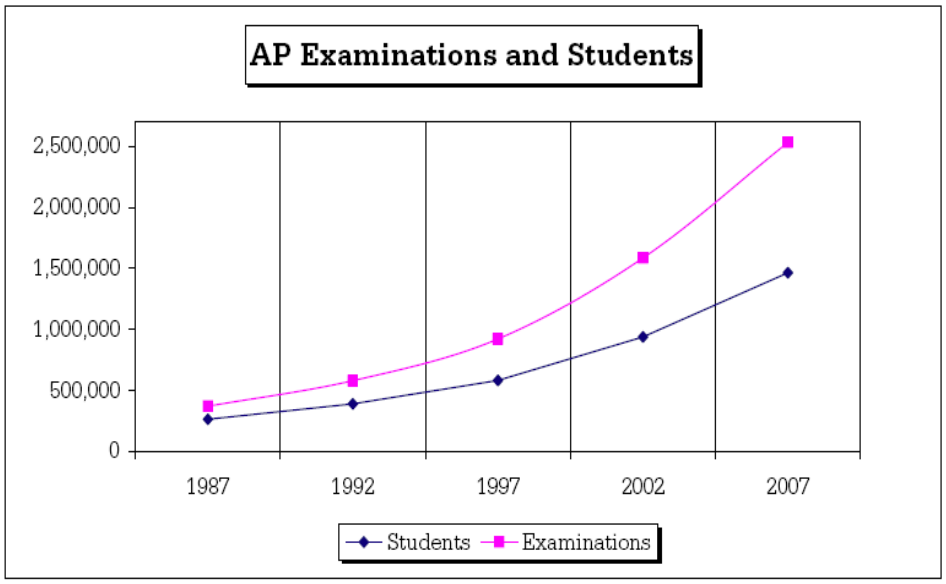

Figure 1. Students participating in AP from 1987 to 2007.

Participation in AP examinations has increased at a rapid rate. A total of 1,580,821 high school students took at least one AP examination in the 2007-2008 school year. This number is up from the 844,741 students that took at least one AP examination in the 2000-2001 academic year (*About the AP*, 2009). In 2000-2001, 13,860 schools participated in AP programs. There are currently over 17,000 schools worldwide participating in AP. There is no indication these numbers will plateau or decrease in the near future and the upward trend predicts future growth.

Kleiner and Lewis (2005) report that approximately 813,000 high school students took post secondary level courses during the 2002-2003 academic year. This report continues to state that 84% of these students were participating in a certified DE experience with their high school. By several accounts (Bailey et al., 2002; Kleiner &

Lewis, 2005), the number of students participating in DE has increased yearly and will continue. These statistics help demonstrate the significance of DE by illustrating how many students are affected by this program. A program impacting this many students must be appropriately and adequately assessed to determine what types of outcomes are produced.

This study examines this phenomenon of AP and DE that is affecting so many of today's youth. Furthermore, this study obtains accurate and timely information that contributes to the current body of research and assists in answering the inquiry of whether or not earning college credits by participating in AP and/or DE has an impact on early college academic achievement. Furthermore, this study presents data outlining whether or not the impact on GPA and retention is positive, negative, or non-existent. Data may illustrate that these experiences affect retention but not GPA. These programs are affecting thousands of schools and hundreds of thousands of youth. This is why this study is significant and why this phenomenon deserves attention.

Theoretical Base

Tinto's (1987) theory of student departure and Astin's (1984) argument of student development theory provide the theoretical base for this study. The environmental theoretical base for this study is grounded in Becker's (1975) human capital theory. Tinto (1987) argues that students leave college because they are unable to successfully adjust academically and socially. Astin (1984) posits that student progress is inextricably linked to student involvement and the quality of student involvement. Becker's (1975) human capital model suggests future students calculate the personal rewards such as

finances, which are determined by amount of education and training, and informally assess the possible outcomes of personal investment in advanced education and training.

Student development and persistence are related to academic and social adjustment to higher education (Tinto, 1987). This theory stresses the importance for first year college students to adapt both academically and socially. Succeeding in higher education is more than being academically prepared for the situation. Conversely, a successful first year student must be more than socially adjusted to succeed in college. First year students must learn the academic and social cultural norms and expectations of higher education. This knowledge will increase students' abilities to perform well academically, as well as progress, persist, and succeed. Utilizing this theory, AP and DE may only broach half the issue of easing the transition to college. While Tinto (1987) provides one of the theoretical bases for this study and is widely cited when discussing student persistence, it should be noted that researchers (Bers & Smith, 1991; Brunsden, Davies, Shevlin, & Bracken, 2000; Halpin, 1990; McCubbin, 2003; Metz, 2002; Torres & Solberg, 2001) critique and challenge this theory, purporting that it fails to include several variables that may also contribute to attrition, such as student characteristics (e.g., being a first-generation college student, and being of a certain ethnicity) and institutional attributes (e.g., four year, two year, and HBCU).

According to Astin (1984), student development is directly related to student involvement. The quality of student involvement plays a pivotal role in student development. Students involved in quality, meaningful, and effective support systems and programs are more likely to progress and persist than students who are uninvolved in

these types of support systems and programs. This theory suggests students need to spend time becoming immersed and engaged in order to receive the output of a meaningful educational experience. It could be argued that AP and DE provide quality student involvement prior to subsequent college enrollment.

Human capital theory (Becker, 1975) posits individuals consider possible personal outcomes when deciding to pursue education and training. Individuals subconsciously and informally create a cost benefit analysis of possible life choices. Therefore, individuals who decide to pursue advanced education and training have done so with the idea that they will benefit from the accomplishment of their goals. It is important to note that human capital theory does not state all individuals are driven to receive advanced training and education because it will yield financial reward. However, the theory argues that individuals informally evaluate and analyze the possible outcomes and rewards of pursuing more education and training. Human capital theory "postulates that expenditure on training and education is costly, and should be considered an investment since it is undertaken with a view to increasing personal incomes" ("Human Capital Theory", n.d., para. 2). Participation in AP and/or DE and early college academic performance could be linked to students' evaluations and decisions regarding their end goal.

CHAPTER 2
LITERATURE REVIEW

Purpose of Literature Review

This literature review provides a foundation for the purpose of this study. This chapter presents a strong emphasis on the establishment and assessment of two (i.e., Advanced Placement and Dual Enrollment) Credit Based Transition Programs (CBTPs) and why researchers are obliged to continue studies that illuminate the impact these programs have on college performance, retention, and success. There are five major components of this literature review. The first section introduces the importance of the transition from high school to college. The difficulty of the transition from high school to college, both historically and in this literature review, leads to the introduction of CBTPs. The CBTP section focuses on the history, purpose, different models, and effect on higher education. Primarily, the majority of the second section will introduce the two CBTPs, Advanced Placement (AP) and Dual Enrollment (DE), that are the focus of this study. Section three, DE, focuses on the relevant DE literature to provide a detailed perspective of current assessment practices, program effectiveness, concerns regarding common practices, and gaps in the literature. The fourth component, AP, illuminates research findings that: 1) support the claim of AP effectiveness and 2) oppose or question the effectiveness of AP as it relates to enhanced college success. Section four also introduces gaps in the AP literature. The review concludes with a brief section illustrating how this study contributes to and enhances the current body of research and literature.

Importance of the Transition From HS to College

The National Center for Education Statistics (NCES) provides data referencing the number of US students who graduate from high school and continue to postsecondary education within 12 months of graduation. The data presents pieces necessary to complete the picture illustrating the current state of educational attainment in the US. Furthermore, the NCES data supplied provides a foundation for understanding why effective CBTPs should entail, among other objectives, a focus on introducing the opportunity of college to the massive number of students who do not pursue higher education.

NCES (2007) reports that 66% of 2006 high school completers enrolled in college within 12 months of high school completion. The total number of high school completers in 2006 was 2,692,000 and the total number of students who transitioned to college within a 12 month period subsequent to graduation was 1,776,000. In other words, more than three out of every 10 high school graduates did not attend college immediately after graduating from high school in 2006. Two foci of CBTPs are to build general awareness regarding the opportunity to attend college and to communicate what college can provide. NCES statistics should encourage educational administrators to explore and determine if this goal is being accomplished. Effective CBTPs have the potential to enhance the number of high school completers attending college immediately after high school graduation and this increased educational attainment is one reason why research must continue to assess the effectiveness of these programs.

The National Center for Higher Education Management Systems (NCHEMS) identifies yet another component of the high school to college transition that is in need of improvement. Again, these data will illustrate how effective CBTPs can play a role in student development and achievement. The NCHEMS (2009), using data from NCES's Integrated Postsecondary Education Data System (IPEDS) Enrollment Survey, reports retention rates that strongly support the need to have effective CBTPs. The 2007 first year retention national average for first time college students at four year institutions is 75%. Several states, including and not limited to Arkansas, Colorado, Florida, Kentucky, and Louisiana had first year retention averages less than 70%. Therefore, on average in these particular states, more than three of every 10 first year and first time college students did not return to their initial college for a second consecutive year. First year retention rate drops to 46.5% when examining academic progress for part-time, first-time, college students at four year institutions. The national first year retention rate of first time college students attending two year colleges in 2007 was a dismal 53%. Almost half of all full-time, first-time, college students attending two year colleges are not retained to their second year. This number is distressing and bleak considering "community colleges are the critical entry points to higher education and economic opportunity for half of the nation's college students" (CCRC, 2009, para. 2).

Several theorists and researchers (Astin, 1984; Bailey & Karp, 2003; Bailey, Hughes, & Karp, 2002; Cohen & Brawer, 1996; Coomes & Debard, 2004; Klekotka, 2005; Kuh, 2005; Light, 2001; Pascarella & Terenzini, 2005; Plucker, Chien, & Zaman, 2006; Tinto, 1987) have dedicated time, effort, and research to the topic of first year

college students. Retention of first year college students is a focal point of many institutions of higher education (Tinto, 1987). Therefore, the fact that CBTP participation has led to an increase in the number of first year college students earning credits pre-college (Advanced Placement, 2009; International Baccalaureate Organization, 2007; Kleiner & Lewis, 2005; Klekotka, 2005; Plucker et al., 2006) should be important to higher education administrators. Current literature requires more depth and breadth of research examining outcomes of students who participate in credit bearing pre-college programs known as CBTPs. New literature may discover a different type of first year student, perhaps first year students harboring different ideals and possessing dissimilar characteristics, as compared to the previous generation of students who transitioned from high school to college. After all, it is the current literature on first year students that is utilized by colleges and universities as a mechanism and platform to create programs with the primary purpose of first year student retention.

Klekotka (2005, p. 1) cites Schneider and Stevenson (2000) with the following statement, "more than 90 percent of high school seniors expect to attend some type of college". However, Klekotka (2005, p. 1) cites Greene and Foster (2003) stating, "only 32 percent of 2001 high school graduates were prepared for postsecondary education, based on satisfactory completion of required courses for college enrollment and demonstration of basic literacy skills." Schneider and Stevenson (2000) address expectations high school students hold in regards to attending college: college is a goal held by the majority of high school students. However, Greene and Foster (2003) argue that less than one third of all 2001 high school graduates are academically prepared for

post secondary education. This is one reason why the first year of college is pivotal and colleges focus on supporting first year students.

Student attrition is most prominent during the first year of college (Plucker et al., 2006; Tinto, 1987). The previous statement supports a multitude of research (Astin, 1984; Bailey et al., 2002; Bailey & Karp, 2003; Cohen & Brawer, 1996; Coomes & Debard, 2004; Klekotka, 2005; Kuh, 2005; Light, 2001; Pascarella & Terenzini, 2005; Plucker, et al., 2006; Tinto, 1987) on first year students' retention. Tinto (1987) believes the first year student transition involves effectively assimilating to the academic and social mores of the institution. Student engagement is also viewed as a pivotal factor for student retention and success (Kuh et al., 2005). Furthermore, Astin (1984) posits that student development is related to student involvement and the quality of involvement.

Tinto (1987) suggests students are more inclined to leave college if there is an unsuccessful academic and social transition to university. This model supports the idea that students who are academically prepared for college level work may leave due to problems and/or challenges associated with their social milieu. However, academic ability is not the sole factor in a student's decision to stop attending higher education in this model. Experiencing culture shock during the first year of college could impede a student's progress as much, if not more so, than academic unpreparedness.

Recent literature from Kuh et al., (2005) states, "what students do during college counts more for what they learn and whether they will persist in college than who they are or even where they go to college" (p. 8). This concept purports that engaged students are successful students. The study of several "DEEP (Documenting Effective

Educational Practice" (Kuh et al., 2005, p. 10) colleges and universities supports the theory that student engagement is paramount for student success. The more an institution of higher education effectively engages the students, the likelier the students are to persist and have a positive academic experience.

Astin (1984) was concerned with ensuring high quality student involvement. This relates to the effective educational practice Kuh et al., (2005) references. Student involvement alone is not enough to secure and ensure student persistence and achievement. Programs must be of strong caliber to positively affect students and increase the probability of retention and achievement.

Research (Astin, 1984; Bailey et al., 2002; Bailey & Karp, 2003; Cohen & Brawer, 1996; Coomes & Debard, 2004; Klekotka, 2005; Kuh, 2005; Light, 2001; Pascarella & Terenzini, 2005; Plucker et al., 2006; Tinto, 1987) introducing, supporting, and acknowledging the importance of the first year college experience has been the catalyst and continual reinforcement for the implementation of first year college programs specifically designed to ease the transition from high school to college. First year programs attempt to broach transition issues and provide a vehicle to increase student academic awareness of college expectations and policies, student engagement, student academic achievement, student satisfaction, etc. Colleges and universities devote extensive resources (e.g., time, employees, and research) to strategically creating, implementing, and assessing first year programs designed to increase first year student retention and academic achievement. Three of the most common first year programs

focusing on transition issues are first year seminars, learning communities, and common reading programs.

First year seminars are credit and/or non-credit bearing courses introducing students to the expectations of college. Courses are primarily taught in the first semester of the first year. Topics include, and are not limited to, the following: time management, goal setting, academic policies, code of conduct policies, study skills, test taking skills, embracing diversity, conflict resolution skills, financial literacy, and successful utilization of support services on campus (e.g., writing, math, and science assistance centers). First year seminars have various names depending on the college or university implementing the program. Some common names for these programs are freshman seminar (FS), first year experience (FYE), and first year orientation seminar (FOS). Instructors vary by institution and several individual institutional and course factors determine instructor eligibility. Several of these factors are listed as follows: course content, academic rigor, institutional contracts, time of day the course is taught, and remuneration for instructing. Regardless of the instructor, name of the experience, and institutional or course factors, the program goal of facilitating a successful first year transition remains constant and axiomatic.

Learning community programs may also be slightly different at each institution. Similar to first year seminars, the ultimate goal of a learning community program is to ease the transition from high school to college by providing academic and social support. Learning communities comprise the same cohort of students attending the same sections of multiple classes. An example of a learning community is 25 first year students who

are all enrolled in the same (i.e., class time, content, and instructors) English, Sociology, and History courses. The basic tenet supporting learning communities, typically 20-40 students, is that students will have a smoother transition to college if they are placed in smaller academic experiences that foster bonds with other first year students. Creation of academic and social bonds is perceived as easier in learning communities because students interact with the same cohort of peers and instructors multiple times a week. Learning communities can consist of as few as two courses or the learning community experience could comprise the student's full roster (i.e., four to five courses) of classes. Some institutions also increase the focus on social engagement by creating residential living and learning communities where students live with a group of students who have all identified similar interests. In some instances, these residential living and learning communities are coordinated with academic learning communities.

Common reading programs are the most standardized and, at many institutions, the least intrusive of the three programs introduced. These programs consist of assigning a piece of literature to an entire incoming class. The expectation is that students will read this book during the summer between graduating from high school and attending college and/or early during the first semester. For most institutions, the reading selection introduces topics similar to scenarios experienced by a first year college student. Examples of these scenarios and book themes are: dealing with diversity, coping with change, setting and accomplishing goals, and overcoming adversity. Books selected for these programs range from classic literature to science-fiction to autobiographies.

Common reading programs are designed to assist first year students with their transition by introducing and normalizing the experiences felt during the first year and creating a sense of solidarity among the incoming class. These two goals can be achieved by designing and implementing programs directly linked to the common reading selection. Some institutions bring the author to campus and mandate first year students attend the author visit: other institutions oblige deans to utilize the college's academic plan to clearly identify and explain how faculty from their college (e.g., the College of Education) will utilize the common reading selection to foster engagement and assist first year student transition, and other colleges have orientation events facilitated by content specialists linked to specific material in the book (e.g., creating a program with a panel of history and law experts if the book has foci on post Pearl Harbor internment camps created in the US for Japanese Americans). Similar to first year seminars and learning communities, the goals of common reading programs are similar in nature regardless of the institution and implementation strategy.

Credit Based Transition Programs (CBTPs)

Purpose and Models

CBTPs are expected to have several objectives and are expected to accomplish a number of goals. Two main purposes for the establishment of CBTPs are as follows. First, CBTPs assist a variety of high school students with the academic and social transition to college (Plucker et al., 2006). The expectation is that students who participate in CBTPs will be more academically prepared and, in some instances, socially prepared for their first year of college (Bailey & Karp, 2003; Klekotka, 2005; Plucker et

al., 2006). Second, CBTPs can assist families with the financial cost of college (Plucker et al., 2006). Students earning college credits in high school may decrease the amount of money needed for tuition in subsequent college years. Students would not pay a decreased tuition rate, in the terms of dollars per credit, which remains constant for all students at an institution. However, students arriving on campus with college credits from high school may pay less money towards tuition during their undergraduate career because they have fewer credits to complete.

There are three CBTP categories (i.e., singleton, comprehensive, and enhanced comprehensive) (Bailey & Karp, 2003; Klekotka, 2005; Plucker et al., 2006). Singleton programs comprise AP and Dual Enrollment and Dual Credit and Dual Enrollment/Concurrent Enrollment. Comprehensive programs are composed of International Baccalaureate (IB) and Tech Prep. Enhanced comprehensive programs comprise Middle College High Schools (MCHS)/Early College High Schools (ECHS).

The singleton program of AP is managed by the College Board. The AP experience involves students participating in an AP course during their high school years (i.e., ninth through twelfth grade). The AP examination is the culminating component of an AP experience. However, a fee must be paid for a student to sit for the examination. Examination fees are largely the responsibility of the student. However, some schools subsidize examination fees. Examinations are scored from one to five. A score of one demonstrates the lowest level of proficiency and a score of five represents the highest level of proficiency in the specific discipline and/or subject. Institutions of higher education decide what scores yield college credit for their particular institution. If a

student scores high enough on an AP examination then he or she will receive college credit from that particular institution.

The second singleton program, Dual Enrollment and Dual Credit/Dual Enrollment/Concurrent Enrollment enables "high school students to enroll in college courses at postsecondary institutions in order to earn both high school and college credits" (Klekotka, 2005, p. 4). In these instances high school students are expected to participate in course work directly produced, controlled, and disseminated by post secondary institutions. This method is extremely different than the AP or IB experience. Dual Enrollment and Dual Credit/Dual Enrollment/Concurrent Enrollment courses can be instructed by college faculty however, courses can be physically located and instructed within a high school or college setting (Klekotka, 2005). Furthermore, courses can be instructed by college faculty or Master's level high school instructors awarded certification from the corresponding post secondary institution.

Comprehensive Programs comprise IB and Tech Prep. IB "…is an international Baccalaureate program. The program is an internationally recognized, rigorous, and comprehensive two-year course of study for high school juniors and seniors" (Klekotka, 2005, p. 5). IB consists of six core areas including "English, second languages, experimental sciences, arts, mathematics and computer science, and individuals and societies" (Klekotka, 2005, p. 5). Similar to AP, post secondary institutions determine what college courses will be exempted and the number of credits a student will receive for completing an IB program.

Tech Prep is the second CBTP placed in the comprehensive category. This program is unlike any of the aforementioned initiatives. Tech Prep is funded by the Department of Education (Klekotka, 2005). These programs are at least four years in length. This experience consists of no less than two years of high school work and two years of postsecondary studies. The majority of students participating in Tech Prep programs are usually preparing for a position requiring technical expertise, or they are enrolled in a certificate or Associate's degree program (Klekotka, 2005). It should be noted that not all Tech Prep programs can be used to attain college credits (Plucker et al., 2006). Once again, the acceptance of college credit is at the discretion of the institution of higher education.

Enhanced comprehensive programs include Middle College High School (MCHS) programs. These programs are also referred to as Early College High Schools (ECHS). MCHSs are located on college campuses (Klekotka, 2005) and are small in size. However, MCHS programs provide the most intrusive and extensive academic and social support of all CBTPs. One of the reasons why these experiences are considered enhanced in comparison to the other programs is that "Middle Colleges combine the benefits of small schools with access to facilities and opportunities that are more typical of large schools" (Klekotka, 2005, p. 5).

Several researchers and theorists (Fischer, 2007; Johnson & Brophy, 2006; Jordan, Cavalluzzo, & Corallo, 2006; Kyburg, Hertberg-Davis, & Callahan, 2007; Mayer, 2008, Sadler & Tai, 2007; Vanderbrook, 2006; Wright & Bogotch, 2006) identify current and potential concerns with the perceived effectiveness of CBTPs. The range of concerns

regarding these programs is as follows: 1) ineffective teaching, 2) concerns that the highest AP exam score does not truly validate mastery of a subject, 3) each state legislature has different rules for Dual Enrollment and Dual Credit and Dual Enrollment/Concurrent Enrolment programs, and 4) large variance regarding how Blacks and Hispanics perform in CBTPs versus how Caucasians perform. However, Smith's (2007) study of 304 students from rural Kansas found that "participation in dual credit programs had a positive and significant relationship with educational aspirations" (p. 371). This only broaches the topic of varying research studies reporting on the effectiveness of CBTPs. Subsequent sections of this review will illuminate this variance as it specifically pertains to the impacts of AP and DE. The forthcoming segments establish cause for continued evaluation and studies, such as this current study, that have further examined the effect of CBTPs.

Advanced Placement (AP) and Dual Enrollment (DE) in Greater Detail

A clearer and more comprehensive understanding of AP and DE is essential in order to contextualize the importance of researching this phenomenon and the effects these programs have on students and higher education. The subsequent three subsections are devoted to further explaining the intricacies of AP and DE and illuminating the role colleges and universities assume, by the nature of promulgated policies and decisions, with regards to these programs and students who participate in these experiences. The College Board (2009) states,

> Advanced Placement is a rigorous academic program built on the commitment, passion and hard work of students and educators from both secondary schools and higher education… AP provides willing and academically prepared high school students with the opportunity to study and learn at the college level. (College Board, 2009, p. 1)

AP consists of 37 courses that represent a multitude of academic disciplines. Students have the ability to take end-of-course examinations designed to measure the level of academic attainment regarding the specific discipline studied. AP examination grades range from one through five. According to the College Board, AP examinations are a salient component of the AP experience and afford students the ability "to demonstrate their mastery of college-level course work" (College Board, 2009, p. 1). Furthermore, examinations are extremely important because colleges and universities utilize examination results during admissions procedures and to determine academic course exemptions and placements. These effects will be discussed in greater detail in the "effect on higher education section".

The College Board has recently responded to pleas (Freedman et al., 2001) to further implement a system of checks and balances. Prior to AP's course audit system, AP courses were not monitored for academic rigor. High schools could literally label any course an AP course and integrate that course into their curriculum without any oversight, review, and/or communication with or/from the College Board. During this period, the College Board relied on the culminating examination to assess and determine if students were learning the material. The former summative outcomes approach of validating AP quality was to utilize the AP examination scores as a measure of learning and success. In

this instance there was no need for quality assurance of each course because all AP examinations were standardized and student level of academic discipline specific attainment would be effectively measured by the score on the corresponding AP examination. Recently, AP has taken a more proactive approach to assessing courses high schools desire to label, and advertise, as AP experiences. The College Board (2009) reports,

> …through the AP Course Audit, AP teachers submit their syllabi for review and approval by college faculty. Only courses using syllabi that meet or exceed the college-level curricular and resource requirements for each AP course are authorized to carry the AP label. (College Board, 2009, p. 1)

This added measure of assessment has assisted with assuring that courses meet the AP standard. The College Board purports the AP standard is college-level work. If this new assessment approach is effective and accomplishes the intended goals, then the number of students obtaining at least a three or higher on AP examinations should increase. This quality assurance approach to AP courses was recently implemented and future studies should attempt to assess if this new policy makes an impact on the AP experience and AP examination results.

The final insight into the AP program that will further assist in explaining and supporting the need to research the impact of AP is the number of AP participants. AP examination participation is increasing at a high rate. In the 2000-2001 academic year, 844,741 high school students were administered at least one AP examination. In 2007-2008, the number of high school students sitting for at least one AP examination rose to 1,580,821. This is an examination participation increase of over 87% in less than a 10

year period. It is important to note, this number represents only students who took at least one AP examination. The total number of students participating in AP courses is unavailable at this time. If the number of students participating in AP examinations continues to rise then this could facilitate a shift in the characteristics embodied by a traditional first year college student.

Dual enrollment is not as clearly defined as AP. This is largely due to the fact that DE programs can vary by state, county, school district, and school (Bailey et al., 2002; *Dual Enrollment*, 2006; Hoffman & Robins, 2005). This variance is well documented and explained in greater detail later in the literature review. However, it is prudent to take a moment and distinguish different types of DE experiences. Identifying the differences throughout DE programs will present: 1) the information required to understand the difficulty with fully understanding this particular CBTP and 2) the importance of assessing the effectiveness of DE.

Different approaches to DE will be described within the confines of three most common programmatic implementation options. The first option reflects an experience that occurs at the physical plant of a high school. The second experience involves high school students attending a college or university in order to participate in the program. The last option implemented involves DE as delivered and received through on-line learning.

DE programs occurring at a high school could have several implementation approaches. First, the course could be taught by a professor employed at the college where the DE relationship is formed. This college professor would travel to the high

school several times a week to instruct the course. A second option for this approach is for the course teacher to be a high school instructor certified by the college or university where the DE agreement has been executed. These instructors must have at least a Master's degree in the discipline of instruction. However, training and certification standards can vary from college to college. Two other components to consider when evaluating this approach are course curriculum and type of students. DE student experience varies because course content is not standardized, similar to AP before the implementation of the course audit system. Therefore, experiences will present varying levels of academic rigor. Lastly, the type of student (e.g., high achieving, at risk, moderately achieving, and low-income) selected for this program may differ from school to school.

The second approach, requiring students to attend the college offering the DE course, also differs in implementation strategies. Some scenarios mandate the high school student must participate in the college course within the time frame of a normal high school day. Other programs require students attend a course that does not interfere with their high school schedule. Each strategy involves students in a college course, at a college setting. However, the course may be composed of all high school students, or the course may integrate high school and college students. The last considerable difference that may occur with this type of DE implementation strategy is the issue of payment. Participants in certain programs have the full cost of the college tuition covered by the high school or partly subsidized by the high school and partly subsidized by the college.

Other implementation strategies require the high school student to pay a portion or all of the tuition for the experience.

On-line DE experiences can be considered least desirable when the goal is to truly assist students with the transition to college. The reason is this third approach has the highest likelihood of failing to create an academic and social environment similar to the first year of college. The majority of first year college students do not take courses on-line. Therefore, this program would seemingly be ineffective by sheer nature of the delivery mechanism. All three approaches to DE raise questions regarding assessment and effectiveness. This further illustrates and supports the need for continual effective assessments.

Effect on Higher Education

Higher education has embraced AP and DE experiences and allowed these programs to alter a student's educational path. The following section introduces three instances illuminating how participation and attainment of credit in AP and DE are supported and encouraged by higher education. Firstly, students who participate in AP and DE are viewed as high achieving and highly motivated students and this may affect their college admission process. Secondly, entering college with incoming credits can, and in many instances will, exempt students from participating in the placement examination phase of the college matriculation process. Lastly, this section highlights how arriving at college with credits, or in the case of AP being issued credits upon arrival, can lead to course exemption and possible adverse and unintended outcomes for first year students.

Researchers (Geiser & Sanetlices, 2004; Klopfenstein & Thomas, 2006) examined how participation in AP plays a role in the college admissions process at some institutions. The explanation behind why participation in this CBTP would matter is that AP is touted as an experience for high achieving and highly motivated students. Relying on this assumption, colleges and universities began to utilize AP participation to determine the quality of an applicant (i.e., the more AP participation, the better the student). According to Klopfenstein and Thomas (2006), "in 2000, a survey of 962 four-year public and private colleges and universities showed that AP experience factors directly or indirectly into at least six of the top nine criteria in college admissions" (p. 2). This impact on admissions decisions is disconcerting as it has become axiomatic that participation in an AP experience does not directly correlate to subsequent college success (Dougherty, Mellor, & Jian, 2006; Geiser & Sanetlices, 2004; Viadero, 2006; Zarate & Pachon, 2006).

Admitted students, who receive credits from AP and DE, may be exempted from the institution's placement examinations. Placement examinations are expected to assess the current level of proficiency in reading, writing, and mathematics. In other words, colleges utilize their own placement examinations to determine how a student's level of English and Math proficiency correlates to that institution's English and Math courses. This process ensures all students are measured by the same criteria and advised to register for the appropriate courses at the institution. Students entering with certain AP examination scores on English and/or Mathematics examinations or college credits in these subject areas, from a DE experience, may be exempt from the college's placement

examination. One of the concerns with this practice is that the AP or DE experience could have occurred as many as three years prior to a student entering college. That is, students may have taken AP examinations or DE courses as sophomores in high school. There can be disadvantages and academic and social repercussions for a student entering advanced (e.g., Abnormal Psychology) and/or sequence (e.g., Calculus II and Organic Chemistry) courses based on educational achievement attained three years prior to college enrollment. Placement into higher level courses does not determine first year success.

An example of course exemption is a student who performs well enough on the AP Chemistry examination (i.e., an examination grade of a three at many colleges and universities) to receive college credit for General Chemistry I (i.e., three credit lecture class) and General Chemistry I Lab (i.e., one credit laboratory class) and General Chemistry II (i.e., three credit lecture class) and General Chemistry II Lab (i.e., one credit laboratory class). This student would be given the option, and possibly encouraged, by his or her academic advisor to register for the sequence chemistry course; especially if this student wanted to pursue chemistry for enjoyment, had an interest in becoming a science major, and/or an interest in medical school. The sequence course for General Chemistry I and II are Organic Chemistry I and II. In other words, the student in this example must possess a level of chemistry proficiency to facilitate academic achievement in organic chemistry. It is not difficult to understand how academic achievement in organic chemistry may elude the student if the most recent chemistry experience was in tenth or eleventh grade. In some instances, the student will be advised and better suited

registering for General Chemistry I and General Chemistry II. Unfortunately, these credits will not apply to graduation requirements because the student in this scenario has previously received General Chemistry I and II credits for the AP or DE experience. Colleges do not count the same course twice when accumulating credits toward graduation. This realistic, and all too familiar, situation captures the possible detrimental outcome of course exemption.

The general chemistry sequence would be a refresher, depending on how much the student remembers. The student would not receive college credit toward graduation for the general chemistry experiences because credit was already granted for the AP examination or DE achievement. Case studies similar to this situation need to be further examined in an attempt to explore all aspects and possible effects (e.g., primary, secondary, residual, and unintended). The manner in which higher education supports and incorporates participation and outcomes produced by AP and DE into their policies is another rationale supporting why these CBTPs demand additional solid research. This research must critically assess program objectives and outcomes, as well as effectiveness, as they correlate to subsequent college performance and success.

Dual Enrollment (DE)

Dual enrollment (DE) is classified by Plucker et al., (2006) as a singleton CBTP. Singleton "programs allow high school students to take college-level courses that enrich the high school curriculum, exposing the student to college-level academics and giving them a "head start" in postsecondary education" (Plucker et al., 2006, p. 3). Students participating in DE have the opportunity to satisfy high school requirements and earn

college credits by completing a course determined to posses the academic rigor of post secondary education. DE can also be referred to as Dual Enrollment and Dual Credit and/or Concurrent Enrollment. The program, from this point forward in the literature review, will be referenced as DE unless quoting from literature referring to the program by another name. The following section will illuminate common and important themes in the current literature that has attempted to assess DE programs. These themes consist of: 1) assessing DE, 2) effectiveness of DE, 3) concerns regarding DE practices, and 4) gaps in the current research and literature focusing on DE.

Assessing Dual Enrollment (DE)

It has proven difficult to assess DE programs (Andrews, 2004; Bailey, et al., 2002; Barnett, et al., 2004; Hoffman & Robins, 2005). One reason is because DE programs can vary (Bailey et al., 2002; *Dual Enrollment*, 2006; Hoffman & Robins, 2005) in scope, size, and implementation method. Students can participate in a DE experience on a college campus where class is taught by a college faculty member. If this is the case, students may or may not be integrated with other college students. DE can be implemented as a program where students learn the curriculum in their high school setting. However, the instructor in this example can be a high school instructor certified to teach a college level course (Bailey et al., 2002) and paid the salary of a college adjunct or a college instructor that attends the high school solely to instruct that particular DE course. A third major distinction in DE offerings is an on-line option.

DE is often controlled at the state level (Hoffman & Robins, 2005). The concept of DE takes many shapes. By the time the legislative idea trickles down to the district

and school levels there are several different student experiences referred to as DE. All these programmatic iterations attempt to capture the essence of DE, which is providing opportunities for students to earn college credits, and at times also fulfills high school requirements, by participating in and successfully completing a college course. Hoffman and Robbins' (2005) study on how the six New England states were implementing DE found that,

> Dual enrollment programs and policies have been developed in New England at the school, district, and state levels, but there has not been a comprehensive inquiry that could describe a dominant model or show which programs have demonstrated long term effectiveness. (Hoffman & Robbins, 2005, p. 1)

Research by Bailey et al., (2002) of DE programs in Wisconsin and New York City support Hoffman and Robins' (2005) claim. Barnett, Gardner, and Bragg (2004) had a similar contention when analyzing DE programs in Illinois.

Literature cited (Andrews, 2004; Bailey, et al., 2002; Barnett, et al., 2004; Hoffman & Robins, 2005) in this review represents findings from studies in over 10 states and illustrates the current degree to which most literature assesses DE. Data culled for the purpose of DE assessment could be significantly enhanced, as identified by Kleiner and Lewis's (2005) statement that, "at present, there is no existing national source of information on DE of high school students at postsecondary institutions" (p. 2). Assessment information of specific DE programs spans the spectrum from extremely limited data that could not produce any outcome information to a wealth of data that could provide insight regarding the impact of DE. For example, some states can report

exact numbers of DE participants from each year and other states do not have this information.

Newer research (Kleiner & Lewis, 2005) has answered several questions regarding the number of students participating in DE. Prior to Kleiner and Lewis (2005), researchers (Bailey et al., 2002) were unable to report an "exact count of the number of such programs or enrolled students" (p. 8). Kleiner and Lewis (2005) shed light on this issue by stating that in the 2002-2003 academic year,

> approximately 680,000 high school students took courses for college credit within DE programs. Thus, 84 percent of high school students who took courses for college credit through postsecondary institutions did so as part of a dual enrollment program. (Kleiner & Lewis, 2005, p.7)

It is important to note that the aforementioned research did not attempt to assess the effects of DE participation on college performance. Although the study provided insight necessary to understand the magnitude of DE, the research data did not make any strides toward critically assessing DE outcomes and effects on subsequent college performance.

Andrews (2004) identifies a handful of DE assessments performed by states, universities, or high schools. Several of these assessments involve student self reporting, providing insight on students' perceptions of the DE experience. Research studying the "Syracuse University Project Advance" (Andrews, 2004, p. 4) and the University of Washington (Andrews, 2004) offered the most concrete data regarding subsequent college performance as it relates to select DE programs. Syracuse University Project Advance began in 1972. This project comprised 120 high schools in five states by 1999 and results were reported as follows, "Ninety-three percent of these students report a grade point average of B or above through the four years of college" (Andrews, 2004, p.

4). The University of Washington's research of 88 DE students reported the cohort had a higher percentage of four year degree attainment and a higher grade point average, when compared to non DE participants. Research articles, such as the two aforementioned studies, are the exception and not the norm when reviewing literature focusing on the impact DE participation has on college performance. However, neither study controlled for prior academic performance.

One important and consistent assessment of DE programs has emerged throughout the literature. This singular critique is the idea that the programs must be properly assessed in order to effectively determine recommendations that would increase the efficacy of the experiences. Presently, certain perceptions of DE programs are manufactured by political opinion and not by a true critical view of program outcomes or effectiveness. More time will be devoted to this discussion during the third component of this section. The assessment of the program itself, and not the outcomes or effects, seems to be the current, primary, systemic, and baseline form of DE evaluation (Andrews, 2004; Bailey et al., 2002; Barnett et al., 2004; Hoffman & Robins, 2005).

Effectiveness of Dual Enrollment (DE)

Searching for reports solely assessing the effects of DE on subsequent college performance is a tireless endeavor because, as stated previously, these reports are few and far between and/or only focus on small cohorts and/or guided by student self reporting. Bailey et al., (2002) state DE "is growing rapidly, yet so far lacks a solid basis on which educators and legislators can make decisions about design, size, and targeting" (p. 18). This is unfortunate because,

> in the end, educators and policymakers need to know whether well designed DE programs live up to their potential. Do these students attend college at higher rates, do they have stronger college records, and are they able to make plans and decisions more effectively? (Bailey et al., 2002, p.17)

It is also important to note,

> research on the impact of transition programs on college performance and success is at a very early stage…Given that many programs have entrance requirements, it is difficult to discern whether measured outcomes result from the selectivity of the programs or the experience that the students have in the programs. (Bailey & Karp, 2003, Abstract)

Research (Dodd, Fitzpatrick, Ayala, & Jennings, 2002; Keng & Dodd, 2008; Morgan & Klaric, 2007) attempting to assess performance of DE students as compared to students who participate in AP and received college credit for the subsequent AP examination is available. Research results are in agreement that AP test takers receiving a three or better on an examination outperform their DE counterparts. It is worth noting these studies are not evaluating the college performance of DE participants but comparing the DE experience to a cohort of students who received credit for earning a grade of a three or higher on an AP examination. Researchers are obligated to assess the subsequent college performance of students who participate in DE to illuminate how DE impacts college performance.

Larger, more extensive, cross population and implementation comparison studies could be initiated after the aforementioned initial data are captured. An extensive study may disaggregate and compare all DE experiences. This would assist in beginning to answer the following two major questions: 1) does DE, as a whole, have a positive effect on future college performance and success and, 2) is there a difference in college

performance and success when comparing different DE models? These research questions are as important as comparing college success of DE participants to college success of AP test takers receiving college credit. Incorporating the following variables will also facilitate effective assessment: academic major, overall GPA, first semester GPA, second semester GPA, third semester GPA, SAT Verbal, SAT Math, SAT Total, ACT, high school GPA, high school rank, high school graduation year, parent's level of education, and demographic information (e.g., race, ethnicity, sex, and age).

Concerns Regarding Dual Enrollment (DE) Practices

Literature (Bailey et al., 2002; Bailey et al., 2003; Barnett et al., 2004; Hoffman & Robins, 2005) has clearly established concerns regarding DE programs. A Jobs for the Future (2006) report states DE experiences in Rhode Island are inconsistent and decentralized. This report continues to elaborate on certain concerns stating,

> dual enrollment is not currently designed to promote Rhode Island's PK-16 goals, to increase the rates of college degree attainment, nor does it encourage participation by state's low-income students. (*Dual Enrollment*, 2006, p.1)

According to the study, this concern needs to be met with clear DE policy that provides consistency and removes autonomy. This will facilitate the promotion and proliferation of standardized DE programs implemented within the parameters initially identified by legislators and educational leaders. Other research (Bailey et al., 2002; Bailey et al., 2003; Barnett et al., 2004; Hoffman & Robins, 2005) provides similar recommendations.

Common themes (Bailey et al., 2002; Bailey et al., 2003; Barnett et al., 2004; Hoffman & Robins, 2005) regarding concerns and recommendations for enhancing DE

consist of: 1) tracking students, 2) evaluating student success, 3) evaluating program success in terms of program performance and subsequent college performance (i.e., college readiness), 4) establishing a clear funding stream, 5) ensuring the course offered is truly college caliber, 6) establishing clear articulation for transferability of credits, and 7) implementing general overarching principles as well as governance and oversight. The previous common themes regarding concerns and recommendations clearly begin to describe opportunities for enhancing the DE system.

Gaps in Dual Enrollment (DE) Literature

DE literature, due to the history of the program, lacks a consistent message regarding the proper strategy for implementation and the data needed for fully assessing programmatic outcomes. Literature researching DE programs is in desperate need of outcomes assessment discussing the impact of program participation on subsequent college performance. The concept of DE is promising. However, current research should aggressively approach answering research questions that will illuminate clear objectives, outcomes, and effectiveness.

Students, educational administrators, and policy makers will continue to make uninformed decisions until more extensive outcome-based research is compiled and published. This research can only benefit the academic community. If DE programs are ineffective, then research can present and facilitate a discussion regarding appropriate enhancements. If DE is effective, then educational administrators and policy makers need to continue to bolster the experience and close equity gaps currently prohibiting all students from participating at the same rate. Either way, more research and larger studies

are warranted in order to begin discussing DE outcomes and effects on college performance. This study has not created consistency for DE – nor has this study attempted to compare outcomes and effectiveness of the several different types of DE experiences. This study presents data illuminating the impact of earning credits via DE (i.e., regardless of the type of implementation strategy), as it pertains to college performance. This was accomplished by comparing the early academic performance of three cohorts: 1) students entering with only Advanced Placement (AP) credits ("AP" group), 2) students entering with only Dual Enrollment (DE) credits ("DE" group), 3) students entering with no college credits ("Non AP and/or DE" group).

Advanced Placement (AP)

Studies of the impact of earning college credits, via AP participation, on college performance have become increasingly more intricate and substantial. Common themes throughout the literature assess AP effectiveness and positive correlation to college performance and success (Casserly, 1986; Koch, Fitzpatrick, Triscari, Mahoney, & Cope, 1988; Morgan & Crone, 1993; Morgan & Maneckshana, 2000; Morgan & Ramist, 1998) while other studies (Dougherty et al., 2006; Sadler & Tai, 2007; Viadero, 2006) question whether AP has a statistically significant positive correlation to college performance and success. The following section of the literature review will provide further support for this current study that has contributed to the body of literature assessing effects of AP on college performance. This will be accomplished by identifying findings purporting AP effectiveness, illuminating research questioning and opposing the idea AP has a positive correlation to college performance and success, articulating gaps in the current literature,

and continuing to transparently communicate how this study has advanced current literature.

Findings that Support AP Effectiveness

A frequent misunderstanding of AP research (Adelman, 1999) has led to one of the least disputed common themes in literature assessing the effectiveness of AP. Adelman (2006) states the following in response to interpretations of data presented in his original *Answers in the Tool box: Academic Intensity, Attendance Patterns, and Bachelor's Degree Attainment* (Adelman, 1999),

> a spate of recent reports and commentaries on the Advanced Placement program (e.g., College Board 2005) claim the original *Tool Box* demonstrated the unique power of AP course work in explaining bachelor's degree completion. To put it gently, this is a misreading. (Adelman, 1999, p. 40)

Several researchers (Dougherty et al., 2006; Geiser & Sanetlices, 2004; Viadero, 2006; Zarate & Pachon, 2006), with data from their own studies, agreed with Adelman's interpretation of the data and supported the claim that AP experience alone has no positive effect on college performance. It is now widely accepted that AP participation alone does not have a direct correlation to subsequent college performance (Adelman, 2006; Geiser & Sanetlices, 2004; Dougherty et al., 2006; Viadero, 2006; Zarate & Pachon, 2006). It is important to note that at one time AP experience alone was touted as having a positive effect on college achievement. Plainly speaking, student participation in AP does not correlate to enhanced student performance in college. Prior to research, it was assumed and reported that AP participation would correlate to increased college

performance as measured by factors such as: first year GPA, overall cumulative GPA, first year retention rates, and likelihood of graduation in four years.

After the field realized and agreed AP participation alone did not have an effect on future college performance, literature began to shift towards examining college performance of students as it related to AP examination grades of a three or higher. As a reminder AP examination grades range from one to five with a grade of a one representing the lowest level of proficiency in that discipline and the grade of a five exemplifying the highest level of achievement and proficiency in that particular discipline. An examination grade of a three is most often utilized by colleges and universities as the minimum grade required to receive college credit and/or course exemption for the college course corresponding to the particular AP examination subject area. A grade of a five, as previously stated, is the highest AP examination grade offered and is expected to translate to a grade of an A in the college course of the AP examination subject area.

Curry, MacDonald, and Morgan (1999) studied college performance of students who participated in AP courses and subsequent examinations and found,

> For most AP exams, students with grades of 4 and 5 do extremely well when placed out of the introductory course. As expected, students with AP grades of 3 generally average lower course grades than do students with AP grades of 4 or 5. In the majority of the courses, however, they average course grades better than 3.0 and, more often than not, earn course grade averages higher than students who took the introductory college courses. (Curry, MacDonald, & Morgan, 1999, p. 6)

These findings are supported by literature from other researchers (Casserly, 1986; Morgan & Crone, 1993; Morgan & Ramist, 1998; Simms, 1982; Willingham & Morris,

1986). According to these studies, students who excel with AP examinations do well when placed in the subsequent sequence course, implying that the AP examination grade of a three is a suitable measure used for determining course placement and issuing college credits.

Morgan and Klaric's (2007) research also supports the finding that AP examination grades of three or higher correlate to enhanced college performance and success. The aforementioned study specifically answers the following questions: "is the performance in intermediate-level courses into which AP students are placed comparable to that of non-AP students? Is the performance comparable after accounting for group differences based on SAT scores?" (Morgan & Klaric, 2007, p. 4). The study reported that AP test takers receiving college credits for an AP examination have a statistically significant better performance when compared to non-AP test takers who participated in the introductory college course. Performance in this study was operationalized as course grade in the intermediate course corresponding to the subject area of the AP examination. AP examination grade of a three was cast as the point at which a proven correlation to college success could be identified and AP research (Morgan & Ramist, 1998) examines the validity of an examination grade of a three.

Morgan and Ramist (1998) explicitly support the theory that an AP examination grade of a three is a valid measure of proficiency of a subject at the college level. This is evident in findings, assessing 25 AP examinations in 21 varying colleges, positing students were being properly placed in subsequent courses. According to this study, the measure of a three on an AP examination created validity and reason to move students

into the sequence course in the subject where the AP examination score was a three or higher. Research findings were summarized effectively by Ewing's (2006) comments,

> For 25 AP Examinations, they compared the subsequent course grades of students with AP Exam grades of 3, 4, or 5 who were exempted from the introductory course to the subsequent course grades of all students who took the introductory course (as matriculated college students) before taking the subsequent course. The authors investigated student performance in second-level subsequent courses, as well as third-, fourth-, and even fifth-level courses in some cases. When grades in the second-level subsequent course were investigated, results showed that the majority of students who were exempted from the introductory course because of successful AP Exam grades did at least as well in the subsequent course, if not better than those who took the introductory course. More specifically, results showed that students who earned a 5 on the relevant AP Examination received higher second-level course grades, on average, than students who took the introductory course. Similarly, students who earned a 4 on the relevant AP Examination received higher second-level course grades, on average, in all but four cases (Art History, French Literature, Music Theory, and Macroeconomics), and students who earned a 3 on the relevant AP Examination received higher second-level course grades, on average, in all but eight cases (Art History, Biology, Comparative Government and Politics, European History, Microeconomics, Music Theory, Spanish Literature, and Studio Art General). (Ewing, 2006, p. 2)

Dodd, Fitzpatrick, Ayala, and Jennings (2002) also examined the validity of AP examination grades of a three by comparing AP and non AP groups. This study added to the literature attempting to discern the validity of AP by comparing students taking AP examinations with other groups of students. The data comprised four different entering classes (1996-99) at the University of Texas at Austin and the AP examinations taken most frequently by these incoming classes (i.e., Calculus AB, English Language and Composition, and Biology). Dodd et al., (2002) created and compared the following comparison groups,

> 1. AP students who received credit by examination in the entire course sequence.
> 2. AP students who received credit by examination for at least one course but not all courses in the course sequence.
> 3. AP students who received no credit by examination for any of the courses in the course sequence. Two additional comparison groups were also identified for the University of Texas at Austin samples:
> 4. A non-AP group that was matched to the second subgroup of the AP students listed above using high school rank and SAT Total scores….
> 5. Students who were con-currently enrolled in a college course that is considered to be equivalent to the first course in the sequence while they were still in high school. (Dodd et al., 2002, p. 2)

Findings revealed no significant difference among students who received varying levels of 3 (i.e., low three, moderate three, or high three) on an AP examination. Results also indicated, "AP students who earned credit by examination earned equal or higher grades in the sequent course than the other groups" (Dodd et al., 2002, p. 33), which supports Morgan and Ramist's (1998) findings. This was particularly important to AP supporters because the results reinforced the validity of the AP examination and grading process. Furthermore, AP proponents intended to clearly communicate to college instructors that AP examination grades of a three warrant, by virtue of knowledge gained, course exemption and/or college credits. It is important to note that the distribution of credits and course exemptions based on AP examination grades was a standard some college professors continually opposed (Dodd et al., 2002, p. 1).

As in the case of Dodd et al., (2002), more comprehensive studies began to compare college performance of several groups. The goal was to compare AP test takers receiving college credit and/or placement in a subsequent course with other cohorts of college students in order to identify and communicate any differences in college

performance. Studies (Dodd et al., 2002; Dougherty et al., 2006; Hargrove, Godin, & Dodd, 2008; Keng & Dodd, 2008; Morgan & Klaric, 2007) varied in terms of: 1) classifying cohorts, 2) measuring performance and impact, and 3) operationalizing college performance in different ways. These studies concluded AP test takers receiving a three or higher on an AP examination do as well, and in many instances, outperform other college cohorts.

Dougherty et al., (2006) followed 273,992 Texas 8th graders in 1994. In the 1998-1999 academic year this cohort dwindled to 67, 412 students. Because this study was designed to study students staying in the Texas educational system, the 67,412 students represent the total number of students in the study who graduated and attended a post-secondary institution in Texas. Dougherty et al., (2006) utilized this group of 67,412 Texas postsecondary students to assess "the relationship between college graduation rates and student participation and success in Advanced Placement (AP) courses and exams" (2006, p. 2). The study consisted of analyzing three relationships:

> 1) comparing the college graduation rates of AP and non-AP students;
> 2) comparing the college graduation rates of AP and non-AP students after controlling for students' demographics and prior achievement and the demographics of their high schools; and
> 3) examining the relationship between percent of students from a given high school graduating from college, and the school's percent of students in Advanced Placement. (Dougherty et al., 2006, p. 2)

The study concluded, "the percent of a school's students who take and pass AP exams is the best AP-related indicator of whether the school is preparing increasing percentages of its students to graduate from college" (Dougherty et al., 2006, p. 2). This research is important because it adds to the body of literature that attempts to compare the

performance of AP test takers to the performance of non-AP test takers, while controlling for prior academic history.

Morgan and Klaric (2007), as stated earlier, operationalized college performance as success in the sequence course that applied to the academic discipline of the AP examination. The aim was to review subsequent performance in sequence courses related to 10 AP examinations. This large study consisted of 72,457 first year students in 1994. These students attended 27 different colleges or universities. Findings indicate "students with AP grades of 3 or better had higher grade averages in intermediate college courses than did the non-AP students who first took an introductory course" (Morgan & Klaric, 2007, p. 9). According to research results, these findings remained constant when controlling for SAT score. Similar results were reported by Keng and Dodd in 2008.

Keng and Dodd (2008) compared the college performance of AP students to non-AP students in 10 AP examination areas. This study, once again, was performed with a cohort of students at the University of Texas at Austin and consisted of examining entering classes from 1998-2001. Keng and Dodd's (2008) research is important because of the number of measures utilized. Several of the measures incorporated to operationalize college performance are as follows: total credit hours, overall GPA, number of credits in first year, first year GPA, credits in that particular subject, subject specific GPA, and grade in subject's sequence course. As briefly mentioned,

> the four main groups of students compared included AP students who earned college credit with their AP Exam grade (AP Credit), AP students who did not earn college credit with their AP Exam grade (AP No Credit), non-AP students who were concurrently enrolled in a college-level course while they were still in high school (Concurrent), and a group of non-AP

> students that were matched on high school academic achievement to the AP Credit students (Non-AP). (Keng & Dodd, 2008, p. 1)

The group classified as the non-AP group was matched to the AP group by SAT total score and high school rank. This matching was an attempt to control for prior academic achievement, similar to other research studies (Dougherty et al., 2006; Morgan & Klaric, 2007), when comparing groups. Keng and Dodd (2008) emphasized three major findings, one of which "was that AP students who earned credits by exam (AP Credit group) consistently outperformed other types of students in college, especially in the related subject area" (p. 18). Furthermore, "Results showed that for each of the 10 individual AP Exam subjects, AP Credit students consistently outperformed non-AP students of similar academic ability in all college outcome measures." (Keng & Dodd, 2008, p. 1). Therefore supporting other research (Dougherty et al., 2006; Hargrove et al., 2008; Morgan & Klaric, 2007) findings regarding college performance of AP test takers receiving an examination grade of a three or higher.

Hargrove et al., (2008) reported results analogous to Keng and Dodd (2008). This study was another conducted in Texas, where the following occurred, "performance was examined for five cohorts of 1998–2002 Texas public high school graduates through their first year and 1998–2001 cohorts through their fourth year of Texas public higher education" (Hargrove et al., 2008, p. 1). College performance was measured by GPA from the first and fourth year, number of credits earned at the first and fourth year, and four year graduation rate. The three comparison groups in this study comprised "students who varied by three types of AP® (course only, exam only, and both course and exam) and two types of non-AP (dual enrollment only and other course only) experiences in

high school" (Hargrove et al., 2008, p. 1). In an attempt to control for prior academic history and level of income, methodology matched students by SAT score and participation in the high school's free or reduced price lunch programs. A major finding supporting a positive correlation between AP test takers and college performance was that "students who take AP exams perform as well as or better in college on a number of different outcome measures than various comparison groups" (Hargrove et al., 2008, p. 47).

Findings that Oppose or Question AP Effectiveness

Positions opposing the idea that AP performance enhances college achievement are steeped in first determining what AP performance means. If AP performance refers to AP participation, then research clearly illustrates there is no correlation to enhanced college performance and success (Adelman, 2006; Geiser & Sanetlices, 2004; Klopfenstein & Thomas, 2006; Russell, 2007; Rust, 2007; Sadler & Tai, 2007; Viadero, 2006). It is plausible that the reason for this is because high schools had the ability, until very recently, to label any course an AP course (Geiser & Sanetlices, 2004), regardless of the curriculum. In essence there was no quality control over high school AP curricula. The AP examination was one format of AP that remained standard throughout all AP experiences. This constant was utilized as the only consistent assessment tool that attempted to measure achievement. In other words, AP examinations were a standardized consistent form of evaluating AP: the examination, unlike previous unmonitored curricula, would not differ from high school to high school.

If AP performance is operationalized as AP examination score then at least one study (Sadler & Tai, 2007) strongly contradicts several researchers, positing performance on AP examinations does not correlate to enhanced college success. While other researchers (Klopfenstein & Thomas, 2006; Rust, 2007) support this idea, Sadler and Tai's (2007) study is one of the few that support the claim with research data. The following section will illuminate findings that contradict the idea that AP examination performance positively correlates to future college performance. This will be accomplished by examining results from Sadler and Tai (2007) and critically assessing results from a study (Morgan & Klaric, 2007) primarily proclaiming that AP examination performance positively correlates to future college achievement.

Sadler and Tai (2007) assessed survey data from 8,594 students in 55 randomly selected colleges. The focus of this study was to evaluate whether passing AP examination grades warranted a passing grade in three college science courses (i.e., Biology, Chemistry, and Physics). This research attempted, as did other researchers (Dougherty et al., 2006; Hargrove et al., 2008; Keng & Dodd, 2008; Morgan & Klaric, 2007), to control for prior academic achievement of AP examination test takers and non-AP examination test takers. In this study, controlling for prior academic achievement was achieved by considering such factors as last high school math grade, SAT Math, and other science GPA (Sadler & Tai, 2007). This was a different approach to controlling for prior academic achievement and went above and beyond previous research that solely utilized SAT Total score (Morgan & Klaric, 2007) or research utilizing SAT Total score

and high school rank (Dodd et al., 2002; Keng & Dodd, 2008). Sadler and Tai (2007) report,

> Based on our analysis, it appears that about half of the advantage attributed to AP experience can be accounted for by variables representing the academic abilities and experiences possessed by AP students prior to, or independent of, their AP course experiences. (Sadler & Tai, 2007, p. 17)

Furthermore, research outcomes provided the foundation to posit,

> while the AP examination program is an elaborate system…the Advanced Placement exams themselves appear to fall short of the predictive validity claimed by College Board. Based on the findings from our study, AP exam scores of 3 do not appear to warrant the granting of college credit over those students who take an AP course in high school, but do not take the AP exam. (Sadler & Tai, 2007, p. 17)

These findings are in complete opposition to the outcomes published by several researchers (Casserly, 1986; Curry et al., 1999; Morgan & Crone, 1993; Morgan & Ramist, 1998; Simms, 1982; Willingham & Morris, 1986) asserting that AP examination grades of a three lead to enhanced college performance in subsequent sequence courses. This discrepancy provides reason for the crux of Sadler and Tai's (2007) study to be further examined, expanded, and replicated.

Morgan and Klaric (2007) performed a more extensive study where the research examined college performance in intermediate courses when comparing AP test takers and non-AP test takers. This study reported that the AP groups outperformed non-AP groups at a statistically significant level (i.e., had a higher course grade in intermediate courses when compared to non-AP groups), when SAT scores were included in the regression model holding prior academic achievement constant. It is important to note

that this level of variance in performance was seemingly positively correlated to the AP examination grade.

The research (Morgan & Klaric, 2007) suggests the higher the AP examination grade, the increased likelihood there would be a statistically significant difference in performance between the AP test taker and non-AP test taker. For example, of the ten intermediate courses examined in Morgan and Klaric's (2007) regression model, there was only a statistically significant difference in performance between AP test takers and non-AP test takers amongst three (i.e., English, Calculus AB, and Calculus BC) of the ten intermediate courses when the AP examination grade was a three. There was a statistically significant difference in performance in seven of the ten intermediate courses when assessing an AP examination grade of four or five. Interestingly enough these seven courses identified when examining AP scores of a four were not the same seven courses identified when examining AP scores of a five.

The increase from three courses representing a statistically significant difference in performance for AP test takers who receive an examination grade of a three to that of seven courses for AP test takers who receive an examination grade of a four or five deserves further investigation and study, especially since all three AP cohorts were compared to the same non-AP cohorts and not each other. Morgan and Klaric (2007) state, "the results of this study, for most AP exams, students with AP grades of 3 or better had higher grade averages in intermediate courses" (p. 9). The study fails to explicitly disaggregate the results by AP examination grade (i.e., three, four, and five). Findings, when analyzing AP examination grades of a three, illustrate there was only a statistically

significant difference in performance in three out of 10 intermediate courses. Furthermore, in one instance Chemistry AP test takers did not do as well as non-AP test takers. This further examination of Morgan and Klaric's (2007) study reinforces the divisive literature and inconclusively answers the question of whether or not receiving college credit for an AP examination grade, especially a grade of a three, has a statistically significant positive correlation to subsequent early college academic performance.

Gaps in the Literature

As mentioned at the conclusion of the last section, one of the major gaps in the literature is whether or not students with AP examination grades of a three outperform non AP test takers with similar prior academic achievement, at a statistically significant level, in subsequent college years. A wealth of research (Casserly, 1986; Curry et al., 1999; Hargrove et al., 2008; Morgan & Crone, 1993; Morgan & Ramist, 1998; Simms, 1982; Willingham & Morris, 1986) supports the theory that AP test takers receiving a three or better have improved college performance, while a dearth of research (Morgan & Klaric, 2007; Sadler & Tai, 2007) reveal that AP examination grades are not the excellent predictors of college performance many postulate.

A point of clarification is needed regarding the current literature supporting the concept that AP examination grades positively correlate to college performance and success. Many of these pieces of literature were published by the College Board or Educational Testing Services (ETS). The College Board is the purveyor and monitor of AP. ETS is the testing agency that assisted with creating AP examinations. Furthermore,

ETS executes the function of grading all AP examinations. Additional non-sponsored research would increase the credibility of the results published in studies furnished by the College Board and ETS.

There are three final significant gaps in the literature that will be introduced, including: 1) comparing college performance of AP test takers and non-AP test takers who have similar prior academic achievement, 2) comparing college performance of groups involved in other CBTPs such as DE and International Baccalaureate (IB), and 3) attempting to evaluate the level of motivation of students who participate in CBTPs. Further assessing these additional topics is pivotal to ascertaining the influence of AP, DE, and all other CBTPs on future college performance. This research will benefit the current and future state of the K-16 educational system.

Rust (2007) acknowledges a gap in the literature by stating, "few studies have followed AP students in college by comparing their successes to the successes of other high achieving students" (p. 1). Studies (Dodd et al., 2002; Keng & Dodd, 2008; Morgan & Klaric, 2007; Sadler & Tai, 2007) that attempted to compare groups with similar academic history looked at factors such as high school rank, SAT Total, SAT Math, grades in high school math courses, and science GPA. Additional research should replicate these studies as well as incorporate other factors (e.g., senior year GPA, junior year GPA, grade in Honors courses, parents' income, wealth of the school district, and parents' level of education) to create AP and non-AP comparison groups of similar prior academic achievement and socioeconomic status (SES).

Ewing (2006) further introduces and argues for the inclusion of missing components within the literature by commenting, "very little is known about how AP students compare to students who participate in other accelerated learning programs including IB or dual enrollment programs" (p. 5), which supports claims that very little research attempts to compare performance among participants of different CBTPs. Literature by Hargrove et al., (2008) and Keng and Dodd (2008) provide two examples of research that attempted this type of study. However, more studies are essential in order to provide a better understanding of the impact of CBTPs in general and how CBTP participants compare to each other in terms of college performance and success.

Studies comparing CBTP participant and non CBTP participant cohorts, with similar prior academic and socioeconomic background, are integral as research attempts to illuminate whether CBTP experiences are beneficial. Studies should also attempt to measure and assess the impact of motivation although this variable may be more effectively examined via qualitative study. Whether the measure is internal locus of control or determining a student's likelihood of incorporating the idea of human capital theory, analyses of level of motivation should be executed and presented in future research. This will assist in determining if enhanced college performance and success is due to the motivation of students who self select to participate in experiences such as AP (Adelman, 2006) or if increased performance and success correlates to earning credits from CBTP participation.

Contribution of My Study

This study contributes to the current body of literature assessing early academic college performance of students who participate and receive college credits for AP examination scores and/or DE experiences. This was accomplished by assessing early academic college performance of several cohorts: 1) students entering with only Advanced Placement (AP) credits ("AP" group), 2) students entering with only Dual Enrollment (DE) credits ("DE" group), 3) students entering with both AP and DE credits ("AP and DE" group), and 4) students entering with no college credits ("Non AP and/or DE" group). This division of cohorts complements previous research and fills gaps in the current literature.

CHAPTER 3
METHODOLOGY AND PROCEDURES

The study incorporated four cohorts from the entering fall 2007 class at a large urban research institution. Two tenets of this institution are educational equity and equality. This institution maintains a research and international presence in higher education while affording educational opportunities to historically underprivileged and underrepresented groups in higher education. These cohorts have been previously identified as: 1) students entering with only Advanced Placement (AP) credits ("AP" group), 2) students entering with only Dual Enrollment (DE) credits ("DE" group), 3) students entering with both AP and DE credits ("AP and DE" group), and 4) students entering with no college credits ("Non AP and/or DE" group). Furthermore, this study incorporated a wide range of variables to enhance the validity and ability to measure the true impact of earning college credits prior to college. These variables are as follows: HS GPA, SAT Total, SAT Math, SAT Verbal, parent's level of education, parent's income, receipt of financial aid, number of hours a student planned to hold an outside job during the semester, and demographic information (e.g., race, ethnicity, and sex).

Role of the Researcher

The study was pursued in order to explore the early college academic experience of the increasing population of students entering college with college credits. The first year is pivotal and knowledge of a shift in the characteristics of first year students is crucial for enhancing the first year experience and support systems for first year students. If students entering college with credits are not outperforming peers who did not earn college credits then more time and energy needs to be focused on assessing, discussing,

and possibly restructuring AP and DE experiences. These programs are designed to ease the transition from high school to college and studies such as the current present data and arguments that clearly establish a need to study this phenomenon more intensely.

I am currently the Director of Student Success Initiatives at the Community College of Philadelphia. Presently, I am immersed in the field of researching, evaluating, enhancing, and managing systemic and systematic initiatives designed to assist students with attaining their educational goals. Of the several initiatives I manage, the most extensive is an institutional academic early alert program. To date, I have presented nationally and internationally on topics such as students in transition, first year student programs, and student retention initiatives. Lastly, I have published articles examining the current generation of college students. One particular article examines the characteristics that make the current generation of students different from previous generations and how educational administrators can use this knowledge to enhance communication with students and facilitate educational attainment.

Population and Sample

The population of this study consisted of traditional first year, first time college, fall 2007 admits at a large urban research institution. The population was divided into four specific cohorts. The first cohort ("AP" group) comprises students who earned college credits in high school by taking AP examinations. The second ("DE" group), cohort included students who received college credits in high school by participating in DE. The third cohort was composed of students who earned college credits in high school from AP and DE experiences ("AP and DE" group). The last cohort was

composed of students who earned no college credits prior to entering college ("Non AP and/or DE" group).

Data Collection Procedures

The department of Institutional Research provided the data set for this research. The institution routinely collects data this study needed to analyze. Student information required for this study is collected through several mechanisms at the institution. Part of the information was collected via student transcripts. Some components of the data set were culled from the entering student questionnaire. This questionnaire is completed by each incoming student, as it is a component of the matriculation process and is administered during placement testing that occurs at mandated orientation sessions held the summer prior to entering the institution. Other data were gleaned from the admissions application and certain pieces of the data set were garnered from academic records outlining student progress at the institution. Data from all these resources were fashioned into one data set specifically designed for the purpose of this study.

Data had to be requested from several different sources in order to adequately answer the research questions. Utilizing data from one institutional depository (e.g., admissions application) would have provided only a small portion of information. This would have increased the probability of a research study rife with validity concerns. However, this study included several variables essential to answering the research questions and utilized quite a few institutional mechanisms to yield these essential variables.

It also important to note how students receive college credits from AP and DE participation. AP examinations are administered at the end of the high school semester when the AP experience occurs. Students are requested to submit official AP examination scores to the institution. This request is fulfilled by contacting the College Board. Institution representatives assess the official documents and attach credits to the students' records. Credits are granted by examination score and at the discretion of the institution. This evaluation process is managed in the admissions office, as students at this stage would be placed in the application category of the matriculation process. Students will meet with academic advisors during orientation and these college officials notify students of the credits they have received and discuss how accrual of credits impacts course options and curricular, departmental, and graduation requirements. The process is fairly similar for DE. However, students participating in DE must contact the institution of higher education linked to the DE experience and request an official transcript be sent to the institution where the student has decided to pursue a postsecondary education. Official transcripts will be reviewed and credits will dispersed to the student based on the institution's policies regarding transfer credits. At the institution studied, an academic advisor will also meet with these students during orientation and discuss the potential impact of these college credits.

Data Analysis Procedures

The study utilized several statistical analyses to answer the major research questions. The following statistical analyses were executed by SPSS and analyzed: chi-

square, Pearson correlation, multiple regression, oneway ANOVA, and ANCOVA. Results of the statistical analyses are communicated in chapter four of this dissertation.

Ethical Issues

There were minimal ethical concerns at the onset of this study for the following reasons: data would not reveal any sensitive and personal information (e.g., name, social security number, and place of residence). Data would not be shared (i.e., any portion and/or the data set as whole) with any external entities for unapproved studies or general perusal. Furthermore, I was not, and still am not, employed at the institution where the data were culled. Therefore, I could in no way exert any power over or alter the educational experience of any student within the database. This last concern was viewed as a virtual impossibility before receiving the data set and proved to be an actual impossibility after receipt of the data set, because regardless of my employment status, these data did not reveal student names and/or other identifying information that would have made it possible to match student data with an actual student at the institution. For all the previous reasons, there were little ethical concerns at the beginning of this study and no ethical issues were raised during the actual study.

CHAPTER 4
STUDY RESULTS

This section includes a comprehensive report of the results of this study which examined the impact of Advanced Placement (AP) and Dual Enrollment (DE) on early college academic performance by analyzing and comparing first year and sophomore year persistence rates and grade point averages (GPAs) of four student cohorts who began their education at a large urban research I university in fall 2007. The first component of this section will comprise descriptive data of all groups intended to be incorporated in the study. The four intended cohorts are as follows: 1) students entering with only Advanced Placement (AP) credits ("AP" group), 2) students entering with only Dual Enrollment (DE) credits ("DE" group), 3) students entering with both AP and DE credits ("AP and DE" group), and 4) students entering with no college credits ("Non AP and/or DE" group). Subsequently, this section presents the findings of the three major research questions.

The major research questions are as follows: 1) does earning college credits by participating in AP or DE affect first and second year retention?, 2) does earning college credits prior to college affect early academic achievement; first, second, and third semester GPAs?, and 3) does earning college credits by participating in AP or DE affect early academic achievement; first, second, and third semester GPAs when controlling for other variables such as high school GPA and family income? Subsequently, this section introduces the results of secondary analyses of the study. These additional analyses will further describe and analyze the characteristics of this incoming class and provide more

information regarding variables that impact retention and early academic achievement. This section concludes with a summary of the key findings.

Characteristics of Sample

This study originally consisted of four distinct groups of students entering a large urban research I institution in fall 2007. The four cohorts were as follows: 1) students entering with only AP credits (AP), 2) students entering with only DE credits (DE), 3) students entering with both AP and DE credits (AP and DE), and 4) students entering with no college credits (Non AP and/or DE). There were 4417 students in the population. An overwhelming majority, 4,199, of these students graduated from high school in spring 2007. Another 140 students in the population graduated from high school in 2006. The remaining 78 students did not graduate in 2006 or 2007. An important factor to note is that all students in the study were first time college students. Remaining components of this section will describe each cohort by reporting group characteristics including: basic demographic information, mean high school GPA, mean SAT, percentage of cohort receiving financial aid, and minimum, maximum and mean number of credits earned from AP and/or DE. Figures four through seven provide a visual complement to several of the group's comparison categories presented below. These figures can be viewed in the appendix. Table 4.1 also presents comparative data on each cohort.

Table 4. 1. Demographic data by group

	AP (N = 527)	DE (N = 458)	AP & DE (N = 79)	Non AP and/or DE (N = 3353)
Gender:				
Female	57.5%	54.6%	45.6%	56.8%
Male	42.5%	45.4%	54.4%	43.2%
Ethnicity:				
African-American	17.5%	20.3%	20.3%	15.0%
Asian American	10.6%	9.2%	10.1%	10.3%
Hispanic	3.0%	2.6%	2.5%	3.5%
Native American	0.2%	.2%	1.3%	.3%
Non-Resident Alien	1.9%	3.3%	2.5%	1.6%
Other	4.6%	5.2%	3.8%	4.1%
Unknown	4.4%	4.6%	1.3%	4.7%
White	57.9%	54.6%	58.2%	60.3%
High School GPA	3.33	3.30	3.26	3.34
High School Rank	51.48	49.60	50.37	51.68
Attended Public High School:	76.5%	76.6%	70.9%	77.2%
Financial Aid:				
Yes	90.0%	87.0%	91.0%	90.0%
No	10.0%	23.0%	9.0%	10.0%
Living in Residence Hall:				
Yes	78.0%	82.0%	73.0%	79.0%
No	22.0%	18.0%	27.0%	21.0%
SAT Math	536.85	528.19	508.48	533.37
SAT Verbal	529.13	516.81	491.52	527.68
SAT Writing	505.48	491.92	457.59	508.50
SAT Total	1065.98	1045.00	1000.00	1061.05

The largest cohort in the study was the Non AP and/or DE group. These 3,353 students enrolled without earning any college credits during high school. The majority, 56%, of students in this cohort were female. This gender breakdown is similar for all groups except the smallest group, AP and DE, which will be the last group discussed in this section. More than 60% of this largest cohort was Caucasian. The second and third largest groups were African American and Asian American, respectively composing 15.2% and 10.3% of the cohort. This first group had the highest mean high school GPA of all four groups, which was 3.34 and the mean SAT Math, SAT Verbal, and SAT Total scores were 533.37, 527.68, and 1061.05, respectively. Ninety percent of these students received financial aid and almost 80% lived in a residence hall during their first year of college. Over 70% of these students attended a public high school. The top five schools, within this large urban research institution, selected by these students were; School of Science and Technology (17.5%), School of Business and Management (17.1%), School of Deciding students (16.7%), School of Liberal Arts (14.9%), and School of Communications (12.9%). To clarify, each of the 13 schools at this university afford students the option to declare themselves deciding. This term, deciding, is commonly referred to as undecided in higher education. Therefore, the School of Deciding students is not a default placeholder for all students unsure of their academic path. There are several students in the Schools of Science and Technology and Business and Management who are deciding. The three most popular majors and/or tracks selected by this cohort are as follows: Biology (6.7%), Pre-Pharmacy track (6.0%), and Pre-Nursing

track (4.0%). Similarities and differences amongst these groups will become evident as each group is introduced.

Students who participated and earned college credits via Advanced Placement (AP) are the second largest group in this study. This group comprises 527 students. Similarly, to the largest group, the majority of students in the AP group are female (57.5%). The ethnic groups most largely represented were Caucasian, 57.9%, African American, 17.5%, and Asian American, 10.6%. Students in this cohort had the second highest mean high school GPA of all four groups. The mean GPA was 3.33, which is slightly lower than the highest mean GPA of 3.34 held by the Non AP and/or DE group. The AP cohort had the highest mean SAT Math (536.85), SAT Verbal (529.13), and SAT Total (1065.98) scores. The percentage of students receiving financial aid and living in a residence hall the first year is comparable to that of the largest group in the study. These percentages are 90% and 78%, respectively. An overwhelming 76.5% of this cohort attended a public high school. The top five schools selected by these students are the same as the Non AP and/or DE group. The Pre-Pharmacy track, 7.6%, Biology, 6.8%, and Pre-Nursing track, 4.9%, were most frequently selected tracks and/or majors among this group. The most striking difference between the first largest and second largest cohort in this study is the number of credits transferred (i.e., college credits earned during high school). While students in the largest group, Non AP and/or DE, earned zero college credits in high school; students in the AP group average 7.95 college credits earned during high school. Students in the AP group entered college with a minimum of

three college credits and a maximum of 37. These are credits the institution has accepted and will apply to the students' graduation requirements.

The third largest group in the study is the DE group, consisting of 458 students. Consistent with the two largest groups, the majority of this cohort is female. Only 45.4% of this group is male. This group maintains the pattern of the top three ethnic groups as Caucasian, African American, and Asian American. There is a sharp decrease, when compared with the Non AP and/or DE and AP groups, in the percentage of Caucasians and Asian Americans and an exceptional increase in the percentage of African Americans. Caucasians composed over 60% of the two largest cohorts and less than 55% of the DE group. African Americans respectively represented 15.2% and 17.5% of the two largest cohorts and this ethnic group represents over 20% of the DE cohort. Asian Americans represented a little over 10% of the population for the Non AP and/or DE and AP groups and represents 9.2% of the DE group. The mean high school GPA, 3.3, of this group is less than the two previous groups but the difference is marginal. Similarly, this cohort also had the lowest SAT Math (528.19), SAT Verbal (516.81), SAT Total (1045.00) scores. Eighty-seven percent of students received financial aid, less than the first two cohorts, but not significantly. This group had the highest percentage, 82%, of students living in a residence hall during their first year of college. More than 76% of this cohort attended a public school. The top five schools selected by this cohort are congruent to the top five schools selected by the previous cohorts, although the ranking is different: School of Science and Technology (20.5%), School of Deciding students (18.1%), School of Business and Management (15.5%), School of Liberal Arts (12.4%),

and School of Communications (12.2). Establishing another pattern, the top two academic concentrations selected by this group, Pre-Pharmacy track (7.4%) and Biology (5.7%), are similar to that of the previous groups. However, the third most frequently selected discipline, Film and Media Arts (4.4%), establishes a distinct difference held by this group. The variance of college credits earned during high school is largest in this group, with the range from one credit to 53 credits. The mean number of college credits earned in high school is eight and this is consistent with the 7.95 mean of college credits earned during high school by the AP group.

Students that received college credits via AP and DE represent the last original cohort of the study. This cohort is by far the smallest, with 79 students, and most dissimilar group when examining composition. Unlike the other groups, the AP and DE group is mostly male (54.4%). The breakdown of the top three ethnic groups is most similar to the DE group: Caucasian (58.2%), African American (20.3%), and Asian American (10.1%). At 3.26, this smallest group of students has the lowest mean high school GPA of all groups. This cohort's mean SAT scores were as follows: SAT Math (508.48), SAT Verbal (491.52), SAT Total (1000.00). Ninety-one percent of these students received financial aid, comparable to the percentages reflected by the other groups. However, 73% of this cohort resided in a residence hall during their first year, five percent less than the next lowest group, and nine percent less than the group with the highest percentage of students living in a residence hall during the first year of college. Similar to the other groups, the large majority (70.9%) of these students attended a public high school. The five most popular schools selected as demonstrated by the first three

cohorts, are also the most popular schools for students in this group. However, the ranking has changed: School of Business and Management (21.5%), School of Deciding Students (17.7%), School of Liberal Arts (13.9%), School of Science and Technology (13.9%), and School of Communications (12.7%). In stark contrast to the first three cohorts, the top selected majors for this cohort are Criminal Justice, Finance, International Business Administration, and Journalism. Each major comprises 5.1% of this group's population. The number of college credits earned during high school ranged from as low as three to as high as 33. The mean number of credits earned was 14.01, by far the highest of the four groups in the study.

The next section answers the major research questions and the secondary questions. As demonstrated in Table 4.1, the group that entered the university with both AP and DE credits included only 79 students. While this number is adequate by itself for statistical analysis, the discrepancy between this sample size and the other three groups is too great to meet most of the assumptions for parametric analysis. This is especially true for the post hoc tests that will be conducted after the ANOVA results. As a consequence, it was decided to eliminate this group from all subsequent analyses and to utilize only groups 1, 2, and 3. It should be noted that the AP and DE group had the lowest GPA among all of the groups. A brief discussion of the impact of these students on the results will be presented in chapter five.

Major Research Questions

The first major research question is: does earning college credits by participating in AP or DE affect first and second year retention? The percentage of each group that was retained through the fourth semester is presented in Table 4.2.

Table 4. 2. Percent retained as a function of cohort (i.e., AP, DE, and Non AP and/or DE)

	From fall 07 – spring 08	From spring 08 – fall 08	From fall 08 – spring 09
AP	96.0%	85.4%	82.7%
DE	92.8%	82.5%	79.7%
Non AP and/or DE	94.6%	87.0%	83.9%
Chi Square	5.031	7.132	5.348
significance	.081	.028	.069

To determine if there are differences in retention as a function of group, chi square tests were computed at each semester. As shown in Table 4.2, there was a statistically significant difference in retention in the spring 08 to fall 08 transition with the DE group having the lowest retention rate. It is also noteworthy that the DE group had the lowest retention rate in all three semesters, although the difference was not significant in the first and last semester recorded in Table 4.2. Further chi square tests

compared each group within each semester. The results indicate a statistically significant difference in retention by group during the following semesters and with the following groups: AP and DE cohort during the transition from fall 2007 to spring 2008, DE and Non AP and/or DE cohort during the shift from spring 2008 to fall 2008, and DE and Non AP and/or DE cohort during the advance from fall 2008 to spring 2009. It is also evident from Table 4.1 that the group of students entering college with zero college credits is retained at a higher rate than both the AP and DE cohorts in the third and fourth semesters. A graphic presentation of these data is presented below in Figure 2.

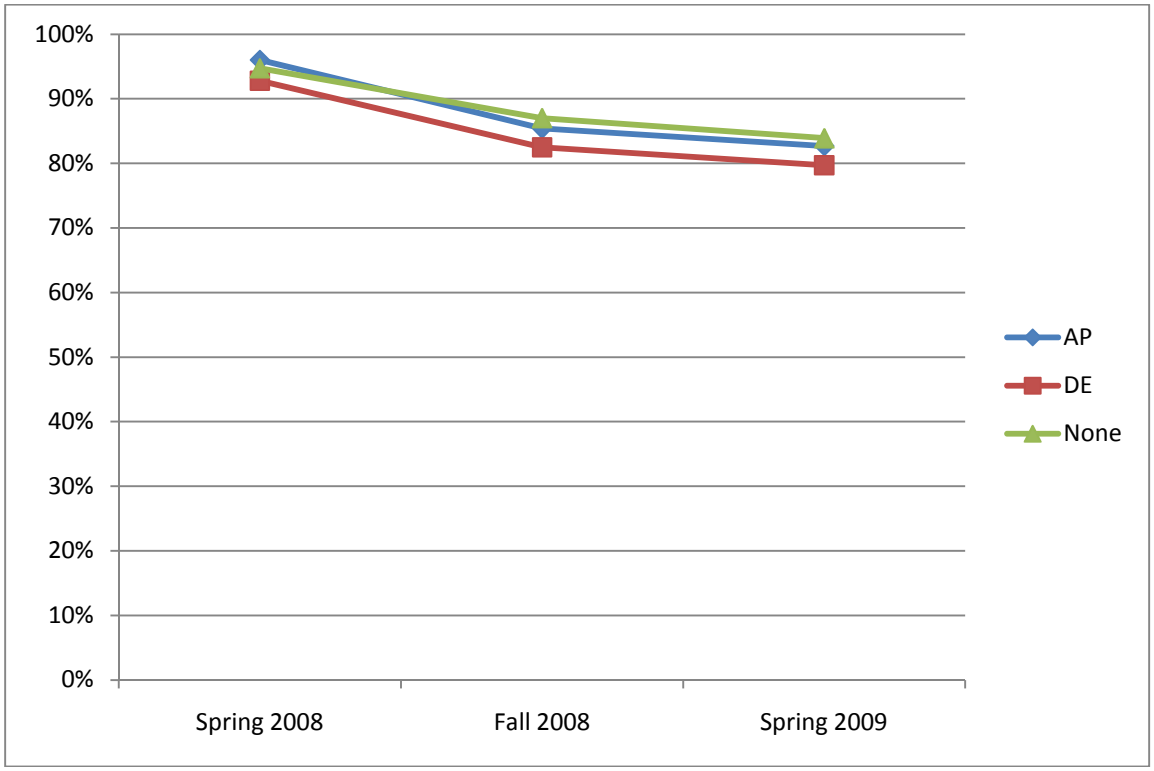

Figure 2. Retention rate of AP, DE, and Non AP and/or DE groups for spring 2008, fall 2008, and spring 2009

The second research question asks if earning college credits prior to college affects early academic achievement. The mean GPA for the three groups in the first three semesters and the results of the one-way ANOVA conducted on these data are contained in Table 4.3.

Table 4 3. Mean GPAs by semester and group (i.e., AP, DE, and Non AP and/or DE)

	End of fall 07	End of spring 08	End of fall 08
AP	2.81	2.88	2.95
DE	2.75	2.83	2.84
Non AP and/or DE	2.80	2.89	2.94
F and significance	F = 1.14, p = .319	F = 1.17, p = .311	F = 3.28, p = .038

As shown in Table 4.3, there is a statistically significant difference in GPA in the third semester. The post hoc Tukey test indicated that the Non AP and/or DE group has a significantly higher GPA as compared to the DE group (p = .034). The difference between the AP cohort and DE cohort approached significance (p = .067). As an additional analysis, a repeated measures ANOVA was conducted on the data presented in Table 4.3. This produced a marginally significant interaction between group and semester ($F_{(4, 7260)} = 2.203$, p = .064). In other words, groups differed in how the average GPA changed over time.

As additional analyses, the one-way ANOVAs and the repeated measures ANOVA were computed again, but this time with the high school GPA, the Math SAT and the Verbal SAT as covariates. These ANCOVAs did not change the essential results as presented above, although the significance level of the interaction in the repeated measures ANOVA increased slightly to .079. Therefore, earning college credits prior to entering college continues to have only a marginally significant impact on early academic achievement even after taking into consideration variance caused by high school GPA and Math and Verbal SAT scores. Consistent with the retention data, the students who entered with dual enrollment credits are performing at a slightly lower level than the AP group or the Non AP and/or DE group. A graph of the GPAs by group and semester is presented below in Figure 3.

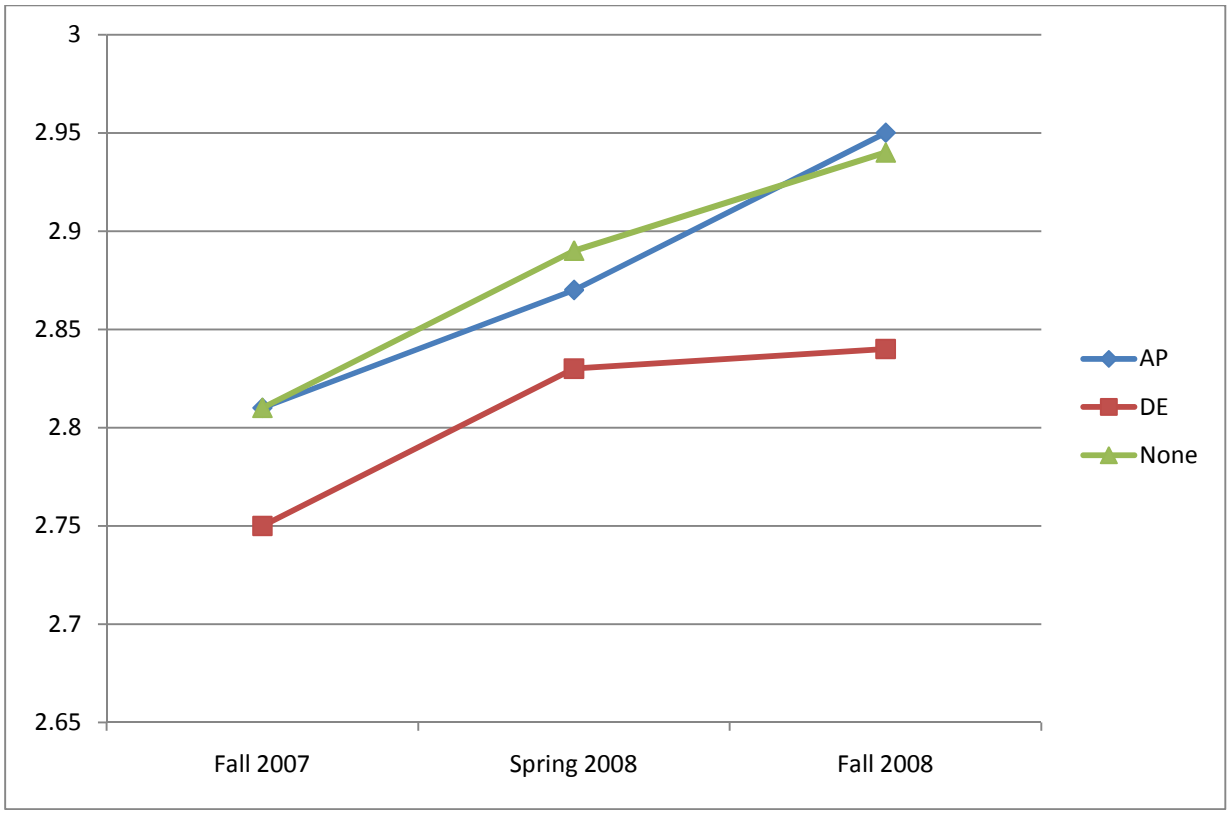

Figure 3. Oneway ANOVA output of GPA means of standard deviation for AP, DE, and Non AP and/or DE groups from fall 2007, spring 2008, and fall 2008

The last major research question is: does earning college credit in high school through AP or DE experiences impact college GPA, during the first three semesters, after controlling for other variables known to predict college grades (e.g., high school GPA, SAT scores, and level of parent's education)? To answer this question, Pearson correlations and full scale multiple regressions were computed. The predictor variables included gender, age, high school GPA, Math SAT, Verbal SAT, Writing SAT, ACT, residence in dorm (coded so that 1 = yes and 0 = no), receiving financial aid (1 = yes, 0 = no), number of transfer credits, student's expected number of non-academic work hours

per week, family income, mother's level of education, and father's level of education. Group (AP, DE, or Non AP and/or DE) is the final predictor in the regression. Because previous statistical analyses identified no statistically significant differences between the AP and Non AP and/or DE cohort, the 'group' variable utilized in the regression analysis was a new variable that represents the comparison of similar groups (AP and Non AP and/or DE) and the one dissimilar group, DE, in the study. The new variable was coded as follows: AP = 1, DE = 2, Non AP and/or DE = 1). The following coding should be taken into consideration when viewing the Pearson correlations: 1) "Dorm Residence" was coded so 1 indicated students living in a residence hall during the first year and 0 indicated students not living in a residence hall the first year, 2) "Financial aid" was coded so 1 indicated students receiving financial aid and 0 indicated students not receiving financial aid, 3) "Work hours per week" is the student's self reported prediction of how many hours a week they planned to work during their first year. The coding was as follows: 0=>25; 1=21-25; 2=16-20; 3=1-15; 4=none, 4) "Family income" is the student's self reported estimate of the family income. Coding was as follows: 0=>$80,000 or more; 1=$60,000=$79,999; 2=$40,000-$59,999; 3=$20,000-$39,999; 4=<$20,000, 5), 5) "Father's education" is the student's self reported data on highest level of education achieved by the father. Coding was as follows: 0=>graduate/professional degree; 1=graduated college; 2= some college; 3=Graduated High School; 4=did not graduate high school, and 6) "Mother's education" is the student's self reported data on highest level of education achieved by the mother. The

coding was similar to the category of "Father's education". The Pearson correlations are presented in Table 4.4.

Table 4.4. Person correlations with first, second, and third semester GPAs

	fall, 07 GPA	spring, 08 GPA	fall, 08 GPA	Cumulative GPA
Age	-.015	-.014	-.028	-.020
High School GPA	.362**	.369**	. 343**	.408**
Math SAT	.170**	.185**	.173**	.212**
Verbal SAT	.205**	.238**	.231**	.253**
Total SAT	.224**	.252**	.241**	.253**
Writing SAT	.253**	.288**	.263**	.300**
ACT	.196**	.276**	.274**	.268**
Dorm Residence	.066**	.058**	.040*	.042**
Financial Aid	.081**	.034*	.031	.051**
Work Hrs per Wk	.128**	.099**	.083**	.129**
Family Income	-.047**	-.064**	-.048**	-.055**
Father's Education	-.037*	-.073**	-.055**	-.067**
Mother's Education	-.033*	-.045**	-.041*	-.047**

*p< .05; ** p< .01

The results of the full-scale regressions are included in Table 4.5.

Table 4.5. Full scale multiple regressions with data in beta weights

	fall, 07	spring, 08	fall, 08	Cumulative GPA
Age	.022	.023	.000	.014
High School GPA	.331**	.349**	.322**	.378**
Math SAT	.015	.012	.008	.030
Verbal SAT	.065**	.077**	.107**	.095**
Writing SAT	.115**	.143**	.103**	.126**
Dorm Residence	.024	.025	.008	.000
Financial Aid	.021	-.027	-.034*	-.011
Work Hours per Wk	.102**	.053**	.057**	.097**
Family Income	-.001	-.016	.003	.004
Father's Education	-.001	-.026	-.015	-.025
Mother's Education	-.016	.003	-.009	-.013
Group	-.016	-.017	-.033*	-.025
R	.427**	.449**	.413**	.489**
Adjusted R2	.180	.199	.168	.237

In response to the last major research question, earning college credits by participating in AP or DE does not have a positive statistically significant impact on early academic achievement except for the moderate effect in the third semester. A new variable was created in order to perform the correlation analysis on Group variable. The 'new group' variable was coded as follows: AP = 1, DE = 2, Non AP and/or DE = 1. Results of this correlation analysis are consistent with the data presented previously. As demonstrated in Table 4.5, high school GPA has the strongest predictive power at all data points. This is followed, in order, by the Writing SAT, the Verbal SAT, and the expected number of hours devoted to non-academic work. High school GPA retained the strongest predictive power when the category of SAT Total score was added to the regression and the disaggregated SAT categories (i.e., Writing, Math, and Verbal) were removed. Disaggregating the SAT categories provides more insight into which variables predict GPA. This is evident that although SAT Total score was a strong predictor, the SAT Math score was not one of the top four predictors when the SAT score categories were disaggregated. Summarizing this, it can be said that at this institution students with higher high school GPA's, stronger Writing and Verbal SAT scores, and the expectation of devoting minimal hours to non-academic work obtain higher GPA's in their first three semesters.

Secondary Analysis

The secondary analysis will answer the following question; 1) Are there significant differences in GPA or retention as a function of race or gender? Results of the secondary question are provided by Chi-square statistical analyses. Answering this question creates

greater understanding of the cohorts in the study and provides further insight on what impacts retention and early academic achievement for students at this institution.

Results indicate that group membership is not dependent on race or gender. Groups are predominantly Caucasian and female. However, being Caucasian and/or female has no statistically significant bearing on a student's placement into one of the three cohorts. This analysis solely compares the composition of the cohorts with the overall composition of the entering class as a whole. This question is not intended to answer general equality, equity, or access issues involving the types of students who are afforded the opportunity, subsequently participate in CBTPs, and earn college credits from these experiences.

Analyses illustrate that retention through spring 2009 is statistically dependent upon both ethnicity and whether or not a student receives financial aid. The four largest ethnic groups in the study are as follows; 1) Caucasian (2,624 students), 2) African American (711 students), 3) Asian American (452 students), and 4) Hispanic (148). Asian Americans had the highest persistence rate (89.4%) through spring 2009. This group was followed by Hispanics who had a spring 2009 retention rate of 86.5%. The two largest groups, Caucasians and African Americans, reported the two lowest spring 2009 retention rates at 82.4% and 82.3%, respectively.

It is illustrated in Table 4.3 that the one variable that negatively correlated to early academic achievement was number of hours a student plans to work during the year. The increased number of expected work hours the larger the adverse impact on GPA. The question asking students their expected number of work hours was part of a entering

student questionnaire that is administered to each student during their English and Math placement examination the summer preceding enrollment. This self-reported estimate of expected number of hours a student will work during the academic year positively correlates to first semester, second semester, third semester, and cumulative GPA. It is important to note the coding of the "Work Hrs per Wk" category in Table 4.4. The positive correlation of the statistical analysis illustrates that GPA increases as the number of expected hours of work per week decreases. This statistically significant correlation did have a minimal effect size.

Summary

The results of this study examining the entire fall 2007 cohort of first time college students entering a large urban research I institution found that the cohorts of students who earned college credits, prior to entering college, by participation in Advanced Placement (AP) or Dual Enrollment (DE) did not have statistically significant higher GPAs through the first three semesters or persistence rates through the first four semesters, when compared to students entering with zero college credits earned prior to entering college. The entering class was broken down into four initial cohorts: 1) students entering with only Advanced Placement (AP) credits ("AP" group), 2) students entering with only Dual Enrollment (DE) credits ("DE" group), 3) students entering with both AP and DE credits ("AP and DE" group), and 4) students entering with no college credits ("Non AP and/or DE" group). The third group, AP and DE, was removed from the statistical analyses and reporting because of the small number of

students in the sample. However, statistical analyses indicated this group performed the worst of all four groups and this finding will be revisited in the final chapter.

Statistical analyses performed on the remaining three cohorts illustrate that retention through spring 2009 was not positively impacted at a level of statistical significance by membership to the AP or DE cohort. Furthermore, the Non AP and/or DE group were retained at a higher percentage for both fall 2008 and spring 2009. Table 4.2 illustrates the retention rate for each cohort by semester. This result is especially salient as it demonstrates that beyond there being no statistically significant positive impact on retention from belonging to the AP or DE cohort, students with zero college credits earned prior to college are actually retained at a higher rate.

The second major finding of this study is that the AP and DE cohorts do not academically outperform the Non AP and/or DE cohort at a statistically significant rate when examining GPAs across the first three semesters. The DE cohort is the lowest performing group throughout the first three semesters. This cohort has a statistically significant lower GPA in fall 2008 when compared with the fall 2008 GPA of the Non AP and/or DE cohort. Therefore, students who earned college credits, prior to college, through participation in DE did not perform as well as the AP cohort or the Non AP and/or DE cohort.

CHAPTER 5
DISCUSSION AND IMPLICATIONS

This culminating chapter further discusses the results of this study and introduces major implications of the study. The first section reintroduces the major findings of the study and discusses these key findings within the context of the current research on the purposes and impacts of Advanced Placement (AP) and Dual Enrollment (DE) on college achievement. The second component of this chapter utilizes the study results to identify and elaborate upon implications for practice. Section three presents ideas and implications for future research.

Summary of Study Results

The first major finding of this study was that students in the Advanced Placement (AP) and Dual Enrollment (DE) cohorts did not outperform, at a level of statistical significance, students in the Non AP and DE cohort. Specifically, this study examined early college academic achievement as defined by first, second, and third semester GPA. Early academic achievement was also operationalized and examined by assessing cumulative GPA from the first, second, and third semesters. The second factor examined, which completes this study's definition of early college academic achievement, was retention throughout the fourth semester, the second semester of the sophomore year.

The second major finding was that the DE cohort had a lower fall 2008 GPA when compared to the Non AP and/or DE cohort. This finding complements the first major discovery in the study. Furthermore, the difference in fall 2008 GPA between the

two cohorts was statistically significant. In other words, the cohort of students who earned college credits prior to entering college by participating in the Credit Based Transition Program (CBTP), designed to ease the academic and social transition to college, of DE were outperformed by the cohort of students entering college with zero earned college credits. This finding is key, as it is counterintuitive that a cohort of students without experience in a program created and implemented to facilitate the academic and social transition to college would have a higher mean GPA.

These two principal findings are extremely interesting given the nature, purpose, and majority of research studying the impact of AP and DE on subsequent college achievement. It is important to note that there is a scant literature analyzing the impact of DE participation on early college achievement (Andrews, 2004; Bailey et al., 2002, Dodd, et al., 2002; Keng & Dodd, 2008; Morgan & Klaric, 2007). Contrastingly, literature is rich with results on the varying impacts of AP on early college academic achievement and college success (Casserly, 1986; Dougherty et al., 2006; Koch et al., 1988; Morgan & Crone, 1993; Morgan & Ramist, 1998; Morgan & Maneckshana, 2000; Sadler & Tai, 2007; Viadero, 2006). Therefore, the following section examining the results of this study in relation to results of previous studies may seem weighted toward AP.

Study Results and the Relationship to the Literature

The first year college experience is integral to the development of college students (Astin, 1984; Bailey et al., 2002; Bailey & Karp, 2003; Cohen & Brawer, 1996; Coomes & Debard, 2004; Klekotka, 2005; Kuh et al., 2005; Light, 2001; Pascarella & Terenzini,

2005; Plucker et al., 2006; Tinto, 1987). The majority of students who stop attending college will do so in their first year (Plucker et al., 2006; Tinto, 1987). Credit Based Transition Programs (CBTPs) are designed to assist with and ease the transition from high school to college with primary goals of increasing academic performance and retention. However, literature (Casserly, 1986; Curry et al., 1999; Hargrove et al., 2008; Morgan & Crone, 1993; Morgan & Klaric, 2007; Morgan & Ramist, 1998; Sadler & Tai, 2007; Simms, 1982; Willingham & Morris, 1986) assessing the impact and effectiveness of CBTPs, specifically AP and DE, is oppositional and in some cases still in the nascent stages. It is imperative to continue studies adding to the body of literature examining the impact of earning college credits via CBTPs on college performance, retention, and success. These future studies should seek to illuminate the effects earning college credits from AP, DE, and other CBTPs have on early college academic performance while also identifying exactly what these effects entail.

Results of this study could be utilized to argue that students who earn college credits by participating in AP and DE experiences do not outperform their peers who have not earned college credits prior to entering college. Results from studies examining this phenomenon, regardless of their outcomes, need to be disseminated to concerned and involved constituents. Educational policies must be restructured and educational administrators are ethically obligated to reconsider current high school experiences and first year college programming, based on comprehensive knowledge regarding the impact of CBTPs.

The following formula makes sense in theory and seems to be what many educational administrators are operating from: 1) a student participates in college level work in high school, 2) the student performs well enough to receive college credits for this work, 3) the student does well in college in general and compared to students who did not have similar academic experiences in high school because success in college level work during high school yields enhanced academic performance during subsequent years of college. However, this study contributes to the current body of literature that posits that earning college credits prior to entering college from AP or DE experiences does not correlate to a student with a statistically significant early college academic performance, when compared to students entering college with zero college credits. AP and DE experiences must continue to be scientifically evaluated. The gravity of these programs warrants the utilization of an ethical and critical lens when assessing and considering the impact on what should be an integrated K-16 educational system.

This study successfully contributes to the dearth of literature on this topic that incorporates academic history and socioeconomic status as variables contributing to academic performance. Only recently have studies examining the impact of CBTPs begun to focus on utilizing prior academic achievement as a factor when assessing the effectiveness of AP. Furthermore, studies vary with the variables chosen to represent prior academic achievement. This is fully covered in the "gaps in the literature" portion of the AP section of the literature review. Second, this research accounts for the impact that socioeconomic status has on academic performance. The last large contribution of this study is the comparison of multiple CBTPs. These comparisons are few and far

between in the current research. There is a shortage of studies attempting to measure the effectiveness of earning college credits, via AP and/or DE, by comparing early college academic performance of students in each group. This study successfully illuminates if AP and/or DE has an impact on early college academic performance. Furthermore, the study highlights exactly how the programs impact subsequent college performance. The two subsequent sections will further discuss, in detail, the significance of this current study as it applies to specific previous research methodology and outcomes regarding the impact of earning college credits from AP and DE. However, this current section will culminate with a discussion of the study results as it applies to the theoretical base.

It is important to reflect on the theoretical base introduced earlier. The theoretical base was provided by Tinto's (1987) theory of student departure, Astin's (1984) philosophy of student development, and Becker's (1975) ideology regarding human capital theory. It is clear how all theories could play an integral role during the college matriculation process. The first two theories are of an extrinsic nature while Becker's (1975) ideology delves into intrinsic qualities.

This theoretical base, coupled with the results of this study, evokes more questions. One question would ask if the institution where the study occurred has a process or system, planned or unplanned, that creates parity regarding early academic performance, regardless of a student's incoming status. While this could explain why the AP group does not outperform the Non AP and/or DE group, this would not explain why the DE cohort is statistically significantly outperformed at some points during the first two years. However, Tinto (1987) and Astin (1984) posit that the impact of the

institution is inextricably linked to student achievement, supporting the idea that the institution as a variable needs to be further examined. This idea is addressed and cultivated later in this chapter.

A major question that arises when examining the results of this study and applying human capital theory (Becker, 1975) is: are these students still motivated during college? Human capital theory presents the idea that students examine personal rewards as it applies and is produced by personal investment in advanced education and training. Students subsequently decide whether or not the personal rewards are worth investing time and effort in advanced education and training. It is important to note that making the decision to pursue advanced education and training and the actual pursuit of advanced education and training are different. This distinction supports the idea that the students who pursue education and training after applying, most likely unknowingly, human capital theory must have some sense of internal fortitude, motivation, enhanced internal locus of control, etc. Perhaps students with this intrinsic motivational factor in high school, as displayed by their actions of participating and receiving credits from AP or DE experiences, no longer possess this trait in college. It is feasible that the advanced training and education these students sought is an undergraduate degree. The student perception could be that this goal is fulfilled by their admission to an institution of higher education. Student motivation may dwindle if the aforementioned scenario is occurring. Therefore, earning credits from AP or DE may not supersede the intrinsic factors possessed by students.

Study Results and the Relationship to Literature on the Impact of Dual Enrollment (DE)

Studies (Andrews, 2004) have presented data indicating participation in DE has a positive correlation to academic achievement and success in college. It is important to note that several published studies seemingly examine general academic achievement and not performance as it relates to other cohorts of students (e.g., students not participating in DE and students earning credits from participation in AP). This general approach to assessing the impact of DE participation further compounds the uncertainty surrounding the impact of DE as it relates to other CBTPs and non CBTP participants.

Andrews' (2004) identifies one study that compared performance of DE participants to performance of non DE participants. The DE participants in the study identified in Andrews' (2004) article attended the University of Washington. These 88 students had a higher GPA and four year graduation rate when compared with non DE students at the institution. Dissimilarly to the University of Washington study, this current study examined GPA through the first three semesters and did not track students through graduation. Results, as previously stated, indicated students in the DE cohort did not have statistically significant higher first, second, or third semester GPAs when compared to the Non AP and/or DE cohort. Furthermore, data from this study showed that the DE cohort had a statistically significant lower fall 2008 GPA when compared to the Non AP and/or DE cohort.

Studies that included more external variables in the statistical analyses (Dodd et al., 2002; Keng & Dodd, 2008; Morgan & Klaric, 2007) sought to compare the impact of DE by examining college achievement of DE participants as compared to students

receiving college credits via AP participation. These studies reported the same primary finding: AP participants receiving a three or better on the AP examination outperformed their DE counterparts. These reported outcomes are congruent with the results of this study. Students in the AP cohort, within this current study, received at least a three on the AP examination because that is the minimum score needed to receive college credits, via AP examination, at the institution studied. The required AP score needed for credit varies (i.e., three, four, or five) but it is never less than a three at the institution where this study occurred. It is important to note that in some instances the same AP examination is not evaluated the same for different exam scores. In other words, a student with an examination score of three might receive three college credits and placement into the sequence course, while a student with the score of a five on the same AP examination would receive a higher number of credits and advanced course placement.

Therefore, it can be stated with certainty that students in the AP cohort within this study had at least a three on the AP examination(s). Results of this study clearly report that AP students have a higher first, second, and third semester GPA as well as cumulative GPA, when compared to DE students. This study also presented findings that show the AP cohort persists at a higher rate through the fourth semester. Neither of the two aforementioned outcomes represented a statistically significant difference. However, the results of this study do clearly support the findings of Dodd et al., (2002), Keng and Dodd (2008), and Morgan and Klaric (2007).

Study Results and the Relationship to Literature on the Impact of Advanced Placement (AP)

Results of this study contributed to the literature (Adelman, 2006; Geiser & Sanetlices, 2004; Klopfenstein & Thomas, 2006; Russell, 2007; Rust, 2007; Sadler & Tai, 2007; Viadero, 2006) finding no statistically significant positive impact between earning college credits from AP experiences and subsequent enhanced college achievement, when compared to students not receiving college credits from AP examination. The AP cohort did not outperform the Non AP and/or DE cohort when measuring first semester, second semester, third semester, and cumulative GPA and retention through the fourth semester. Similar to the more advanced studies (Dougherty et al., 2006; Hargrove et al., 2008; Keng & Dodd, 2008; Morgan & Klaric, 2007; Sadler & Tai, 2007) on the impact of earning college credits via AP, this study did take into account prior academic performance by factoring for the variance in college achievement correlated with high school GPA, SAT Verbal score, SAT Math score, and SAT total score.

This study measured early academic achievement, as represented by GPAs and retention. Several studies promulgating the positive impact of earning college credits from AP examination are far more longitudinal (Dougherty et al., 2006; Hargrove et al., 2008). A second salient point regarding the results of this study is that this study did not specifically assess and compare the performance of the cohorts in sequence and/or intermediate level courses. Morgan and Klaric (2007) and Keng and Dodd (2008) are two examples of studies supporting the positive impact of earning college credits from AP experiences that did operationalize college success as performance in sequence

courses. Both of these studies reported that students receiving at least a three on an AP examination, which would constitute earning college credit at the institutions studied, outperformed their non AP peers in intermediate courses. A more comprehensive account of the literature supporting the positive impact of AP can be read in the literature review portion of this dissertation. A range of the different types of studies were briefly reintroduced at this time for several reasons: 1) to clearly present the results of this study within the larger context of relevant literature, 2) to emphasize the complexity of studying this phenomenon, and 3) to clearly illustrate why the field deserves more studies further examining the impact this intervention has on college achievement and success.

Implications for Practice

There are several implications for practice stemming from the results of this study. This section presents these implications for practice in two categories: 1) implications for practice at the high school level and 2) implications for practice at the university level. Both of these categories have a number of considerations. However, the following list of implications for practice and future research will not be exhaustive. The list will fulfill the charge of presenting several viable considerations for K-16 administrators and researchers.

Implications for Practice at the High School Level

There are five implications introduced in this section. These implications are as follows: 1) a general focus on more academic experiences in high school, 2) creation and/or implementation of other programs designed to positively enhance college achievement and success, 3) effective assessment, 4) effective collaboration between high

schools and colleges, and 5) researching and assessing government policies subsidizing AP. Focusing on these five implications could provide solid framework for administrators. This framework would assist with identifying, supporting, creating, and assessing support programs designed to effectively increase student performance and success in high school and college.

High schools would benefit from focusing on more academic experiences, as opposed to offering experiences that are not axiomatically beneficial, such as AP and DE. This study demonstrates that high school GPA and SAT scores are strong predictors of early college achievement, as measured by college GPA. Therefore, high schools that are able to increase student GPAs and standardized test scores, while increasing academic rigor, could increase the likelihood of significantly enhanced early college performance. Research states,

> well intentioned education advocates have come to the belief that AP is an appropriate, and even necessary, component in the portfolio of the well prepared college student. However, our research finds no conclusive evidence that, for the average student, AP experience provides preparation for college superior to that provided by a non-AP curriculum rich in math and science. (Klopfenstein & Thomas, 2006, p. 17)

A focus on more academic experiences, in general, needs to occur. High school GPA and scores on standardized examinations are not the only factors that impact college performance. Several studies (Contreras, 2005; Palmer, & Gasman, 2008; Seider, 2008; Tross, Harper, Osher, & Kneidinger, 2000; Zwick & Sklar, 2005) discuss the importance of factors, other than high school GPA and SAT scores, that contribute to college performance and success. These factors include, and are not limited to, strength of high school curriculum, student's level of motivation, and socioeconomic status.

The second implication for practice at the high school level directly complements and stems from the first implication. Administrators must consider other interventions, besides AP and DE, to successfully help students with their transition to college. This implication need not necessarily discourage educational administrators to continue AP and/or DE. However, administrators should seriously entertain the idea of diversifying their Credit Based Transition Program (CBTP) portfolios and offerings. AP is the easiest CBTP to maintain and the least intrusive. Perhaps more high schools should incorporate and promote more intrusive CBTPs, such as International Baccalaureate (IB), Tech Prep, and Middle College High Schools (MCHSs). However, these programs are also in need of more assessment. Increasing student participation in these different experiences enhances the opportunity to assess the impact of these programs.

Effective assessment of the impact of AP, DE, and other CBTPs is imperative. It is currently close to impossible to compare all the different types of DE programs. As stated previously, DE programs can take several different programmatic shapes. These different experiences are usually unknown and/or undifferentiated by college officials. In turn, there is no special coding during the college admissions process that would enable a college to track the progress of these students by specific DE experience. Properly assessing DE could be more likely if there were a strong K-16 collaboration. Coding could be universal so students can be tracked regardless of where they attend high school or college. Lastly, implementing a coding system would also assist in further assessing the impact of the other CBTPs.

Strong collaboration between high schools and colleges could also assist in creating AP and DE experiences and curricula that are representative of what is being taught and experienced in college. Presently, the College Board decides what an acceptable curriculum and examination score is for each AP subject. This organization also possesses the power to ultimately decide the composition of each examination. Recently, the College Board has begun reviewing and approving all curricula that any high school labels as AP. This situation places the College Board in a position of complete autonomy. However, the College Board is neither a high school nor a college. Given the College Board's for-profit status, it would behoove high schools and colleges to collaborate and take a more active role in the entire AP program and process. Why is AP setting national standards for high schools? The monopoly created by the College Board and Electronic Testing Services (ETS) should be challenged, given the results of this study and other studies with similar results such as Sadler and Tai (2007). This is the ethical duty of all educational leaders.

The last consideration for practice is the researching and assessing of the government policies that subsidize AP. Studies such as this one present data that show no statistically significant advantage, when measuring college GPA and retention, is gained by earning credits from AP experiences. This begs the question, why should public policy dollars be spent on this initiative? For example, Florida subsidizes AP examination fees and "gives faculty bonuses and extra AP funding to a public high school every time one of its students scores a 3 or better on an AP exam" (Mollison, 2006, p. 3). Policies that subsidize AP need to be critically evaluated for their benefit to the student

and educational system. If earning credits via AP experiences is not preparing high school students any better than a strong academic curriculum, then monies spent on subsidizing AP examination fees and other AP related costs should be utilized for other educational opportunities.

Implications for Practice at the University Level

This study also presents several implications for practice at the university level. Firstly, colleges should consider that AP and DE may not be fulfilling the role of preparation and/or providing sufficient knowledge for students to be placed in sequence and/or intermediate level courses. The second consideration for college administrators is to utilize the results of this study to reassess current college policies. Third, colleges must examine their institution and the student experience. Universities should also consider what impact faculty training has on the performance of students entering with or without college credits. Lastly, colleges must also actively communicate and form beneficial bonds with high schools.

Some college and university administrators view AP and DE as a mechanism to decrease the level of remediation that will occur when a student enters an institution and/or an opportunity to place students in upper level courses. For example, a student entering college with three credits in English because of a score of a four on an AP examination may be expected to perform better than a peer who did not enter with three credits in English as a result of earning a four on an AP examination. Results of this study indicate that there is no statistically significant difference in GPA, in the first three semesters, between students entering with credit from AP and students entering college

with zero credits. The argument could be made that these students should be treated equally and assessed on merits other than credits earned via AP and/or DE. This is a strong argument considering students in this study entering with credits from DE actually performed worse, when assessing GPA and retention during the first two years, than students entering with zero college credits. Strongly considering these results should lead to careful scrutiny of current college policies.

Many colleges have created policies because of the belief that participating and/or earning credits via AP and DE experiences creates a better prepared college student. In the minds of many college officials, AP and DE experiences provide students with the tools needed to outperform their peers. Therefore, colleges use performance in AP and DE as an indicator during the admissions process. Students with these experiences and/or earned credits from these experiences are given points toward their admission's score that enhance their likelihood of acceptance. Some students entering certain colleges with college credits are also able to bypass the institution's placement testing and/or automatically placed into higher level and/or sequence courses. It is important to note that the policies for awarding college credit for AP examination are decided by each institution. This study was performed at an institution that accepted the scores of three for certain AP exams, while other colleges only accept scores of a five. Clearly, results of this study could challenge the appropriateness of some institutional admissions, placement, and AP examination score policies.

While this study did not examine the institution as an intervention, this should be a serious consideration for colleges. College administrators must view their institution as

a major variable contributing to student development and assess the college experience of their incoming students. Perhaps students who have amassed credits prior to entering college are over-confident and do not seek support services such as advising and tutoring. Another possibility is that students who earn college credits prior to college truly believe they are socially prepared for college so they fail to participate in transition programs such as first year seminars, learning communities, and living and learning communities. University officials will be unaware of the impact their institution has on specific groups of students until these types of experiences are created, offered, and properly assessed for all students.

Another impact for practice at the college level is consideration for the need of faculty training. Does faculty training have an impact on the success of students in general and students as a bifurcated population (i.e., students entering with college credits and students entering without college credits)? Perhaps earning college credits by experiencing AP and/or DE has no statistically significant positive impact on early college performance because these students become accustomed to certain pedagogies and instructional methods, which are not present in college. The faculty provide the same experience for all students. Therefore, it may be beneficial for the faculty to learn and understand the previous academic expectations and milieu of students entering college with college credits. However, there is a distinction between faculty training for informational purposes and attempting to mandate that the faculty instruct different groups of students differently. The latter is not being presented as a consideration.

The last consideration for colleges is that of collaboration with high schools. This idea was also mentioned as an impact for practical use at the high school level. Both colleges and high schools need to actively work to build and maintain institutional support structures that enhance the development of an integrated K-16 system of education. Ultimately, this will benefit the students. An example of this would be for colleges and high schools to create a consortium that discusses issues relevant to education. Results of these discussions can be taken to local, state, and federal government entities for consideration and support. A powerful and influential relationship such as this could be the catalyst for reinvigorated education policies and procedures that address issues such as comprehensively assessing the impact earning credits from AP and DE experiences has on college performance and success.

Implications for Future Research

This study demonstrates the difficulty, due to the numerous variables that need to be considered, of examining the impact earning college credits by participating in AP and DE has on college achievement and persistence. The variables utilized in this research are important and should be included in future studies. Subsequent studies must involve several other factors in order to further effectively research this phenomenon. There are five major implications for future research that will be discussed in this section. These implications are as follows:

1) identifying and assessing the type of institution and the interventions at institutions,

2) disaggregating different types of DE programs so these experiences can be compared to each other and to other CBTPs,

3) disaggregating AP examination scores to determine if there is a difference in performance level,

4) devoting more research to the lowest performing group (i.e., students with credits from both AP and DE) in this study, and

5) incorporating qualitative research to assist in identifying factors that lead to early college success.

Future studies need to be both intra-university and inter-university. Colleges should be able to identify students entering their institution with college credits earned during high school. However, this data collection is only the beginning. This basic demarcation needs to be disaggregated so students can be identified by the specific manner in which they earned credits. Therefore, there could be a code for AP, DE, IB, Tech Prep, Middle College High School (MCHS), and any other experiences where students garner college credits prior to entering college. The next step will be to further divide certain groups (i.e., AP and DE) so students can be identified by score (i.e., three, four, or five) on AP examination and type of DE experience. This multilevel disaggregation will provide the framework to more fully analyze the impact earning college credits prior to college has on early college performance and retention.

Studies should advance beyond the time frame of early college performance and retention through the second year. Future studies should be longitudinal and follow students through undergraduate graduation, at the very least. Research could follow students several years after college graduation. Institutions would also need to capture and be able to utilize data from the student's experience in college that impacts college

performance and success. An example of these variables would be first semester GPA, number of credits attempted during the first year, number of credits completed during the first year, academic discipline, number of visits to academic advising, and participation in a first year seminar course.

If all colleges worked toward this goal, then studies could start to compare performance at an inter-institutional level. For example, is there a statistically significant difference in college performance and success when comparing 1,000 students who attended a large urban research institution and 1,000 students who attended a small private liberal arts college, when considering that all members in both cohorts received 15 credits from participating in AP and all students had examination scores of five? Answering questions like the previous one are only the beginning of what is possible if colleges can provide the infrastructure to collect and cull the data needed.

Subsequent studies that answer questions comparing students from different types of colleges may ultimately promote further study of each college as an intervention. Considering the previous research question, what if the cohort from the small private liberal arts college is outperforming the cohort of from the large urban research university? Given that all prior academic achievements and socio-economic status were held constant in this hypothetical study, then researchers would need to examine the college itself as a major dependent variable impacting college performance, retention, and success. These studies could examine any and every institutional factor that may impact a student. Variables could be anything from the widely studied impact of student

engagement to the much less studied effect of the level of spiritual conviction held by the campus community.

The second implication for future research has been discussed throughout the study. DE program participants need to be disaggregated by program in order for studies to clearly analyze the impact of DE on college performance. There are currently several types of DE programs. Certain DE programs involve high school students taking a class at a college; these programs have high school students in a class with other high school students or integrated with college students. Another implementation of DE has students participate in college level courses at a high school. This experience usually has either a college instructor teach the class or a Master's level high school teacher, who is certified by the college where the DE agreement is established. Yet another example of a DE experience involves distance learning. There is also a larger overarching issue concerning DE. The overarching issue with DE is that some high school students participate in a college level course that is not part of a DE program. These students decide to take a college level course regardless of whether or not their high school will assist with subsidizing the cost and/or apply the course to the student's high school curricular requirements. Grouping all DE experiences will provide a misrepresentation of what programs assist students with the transition from high school to college.

Similar to the second implication, AP needs to be disaggregated as well. Specifically, does level of performance vary by AP examination score? Morgan and Klaric (2007) determined this was exactly the case in their study. In other words, students with an AP examination score of a five performed better than students with a

score of a four and students with a score of a four outperformed students with an AP examination score of a three. Studies like this need to be duplicated at different institutions, with diverse student populations. Furthermore, differentiating between all possible DE experiences and disaggregating performance by AP examination score may assist in exploring the fourth major implication for future research.

The poorest performing cohort in this study was the group that earned college credits from both AP and DE experiences. There are many possible reasons for this result. Several of the reasons may involve the type of DE program and are outlined previously in this section. The fact is that AP and DE are being lauded as programs that provide students with an advantage during college. Results of this study could support the argument that if these students were placed at an advantage because of these programs, then something transpired post AP and DE to quell any and all advantages because these students did not outperform their peers who entered college with zero credits. Furthermore, students who experienced two programs touted as preparatory and advantageous appeared to be less successful than any other group in this study. It is imperative this finding is further explored with future research.

The final consideration for future research is the incorporation of qualitative analyses. Qualitative studies can further present information on the impact of earning credits by participating in AP and DE. These studies are capable of examining a major question this study did not broach: what is the student's perspective regarding what makes them successful in college? Qualitative research will provide a more comprehensive view of the stories of students in these cohorts. Perhaps a consistent

factor(s) contributing to student success will be illuminated during student interviews and triangulated with previous research and practices of professionals in the field. One of the major factors qualitative research could examine is the idea of motivation and personal characteristics. For instance, what if the driving force behind student success is a heightened level of internal locus of control or their perceived support system? Other researchers, such as Klopfenstein and Thomas (2006), agree with the benefits of assessing intrinsic human characteristics. This is evident as Klopfenstein and Thomas (2006) state, "first, AP signals two important but difficult-to-measure personal characteristics: ability and motivation…Second, AP experience might build human capital, in which case AP participation is good preparation for college" (p. 4). Qualitative analyses will seriously bolster the research efforts aimed at providing more insight regarding the impact earning credits from AP and DE has on college performance, retention, and success.

Summary

The discussion and implications section of this dissertation presented how the major findings from this study relate to the current literature. Furthermore, this section introduced how the results of this study could impact and benefit high schools, colleges and universities, and an integrated K-16 educational system. The crux of this final chapter is the clear proposition that the impact of earning college credits, prior to entering college, by participating in CBTPs needs to be further researched. This research could facilitate informed policy and implementation decisions. Ethical educational leaders and

policy makers should feel beseeched to champion this endeavor, as the number of students impacted by this phenomenon increases every year.

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APPENDIX
FIGURES IDENTIFYING DEMOGRAPHIC AND ACADEMIC CHARACTERISTICS OF THE COHORTS IN THE STUDY

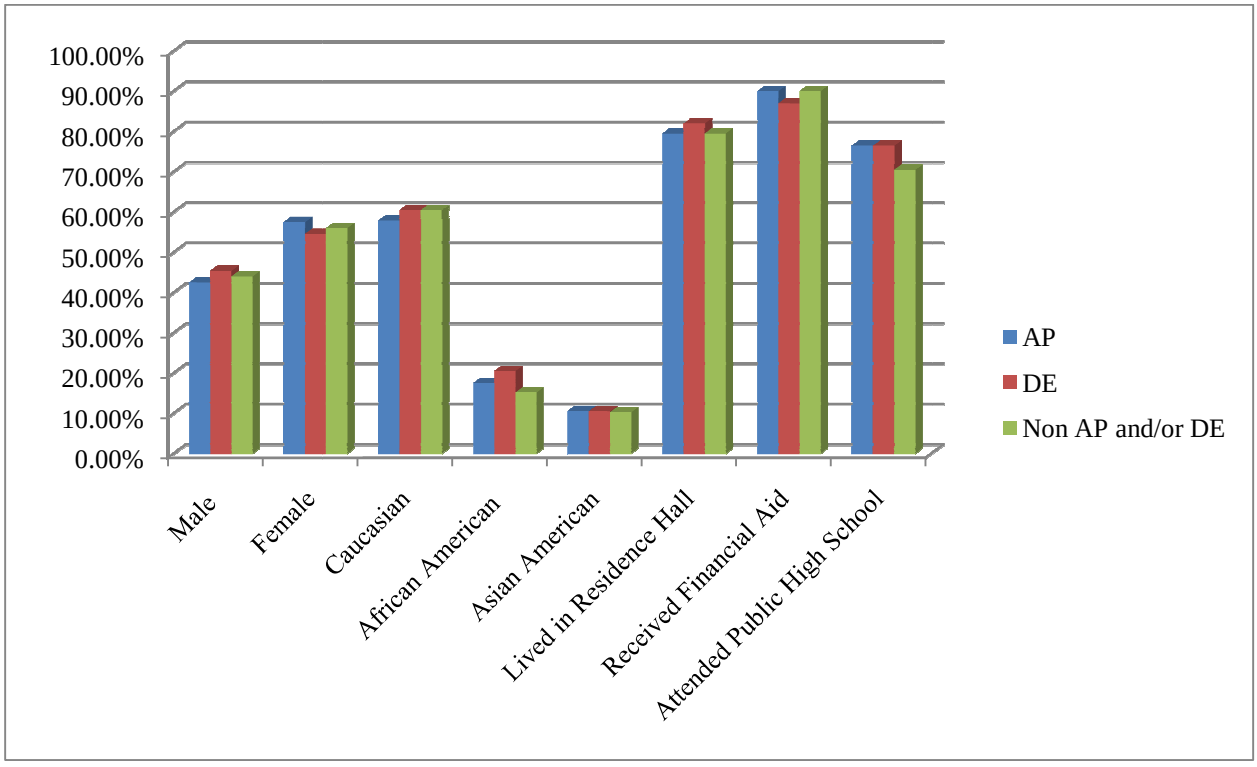

Figure 4. Demographic characteristics of each cohort in the study.
Legend: Self reported information on sex and race. Institutional data gathered regarding first year residence, receipt of financial aid, and type of high school attended

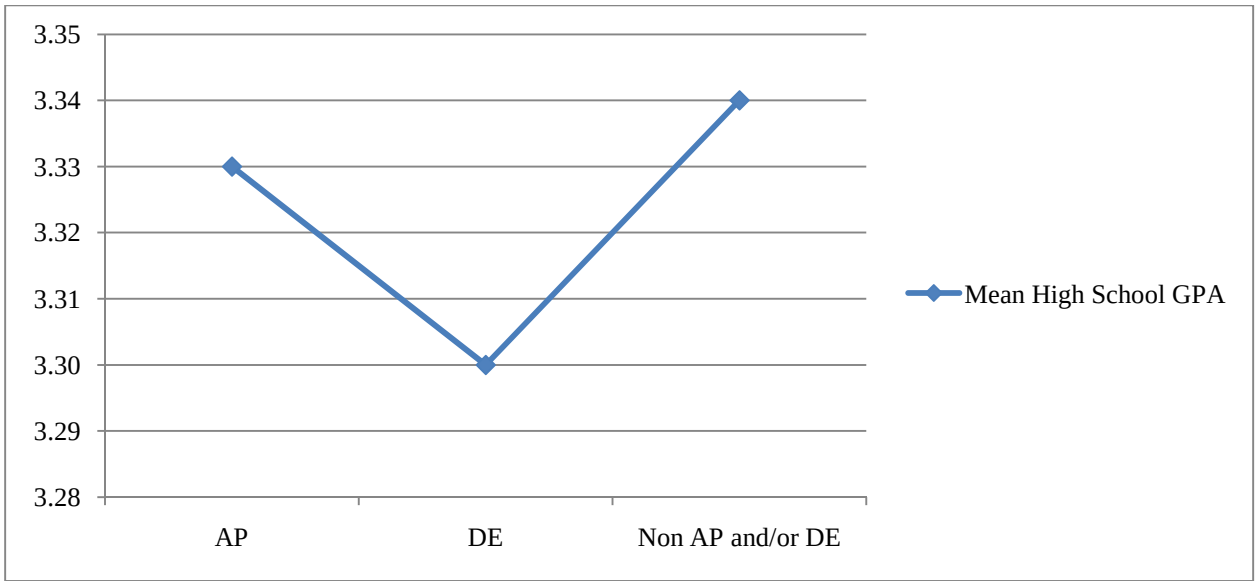

Figure 5. Mean high school GPA of each cohort.

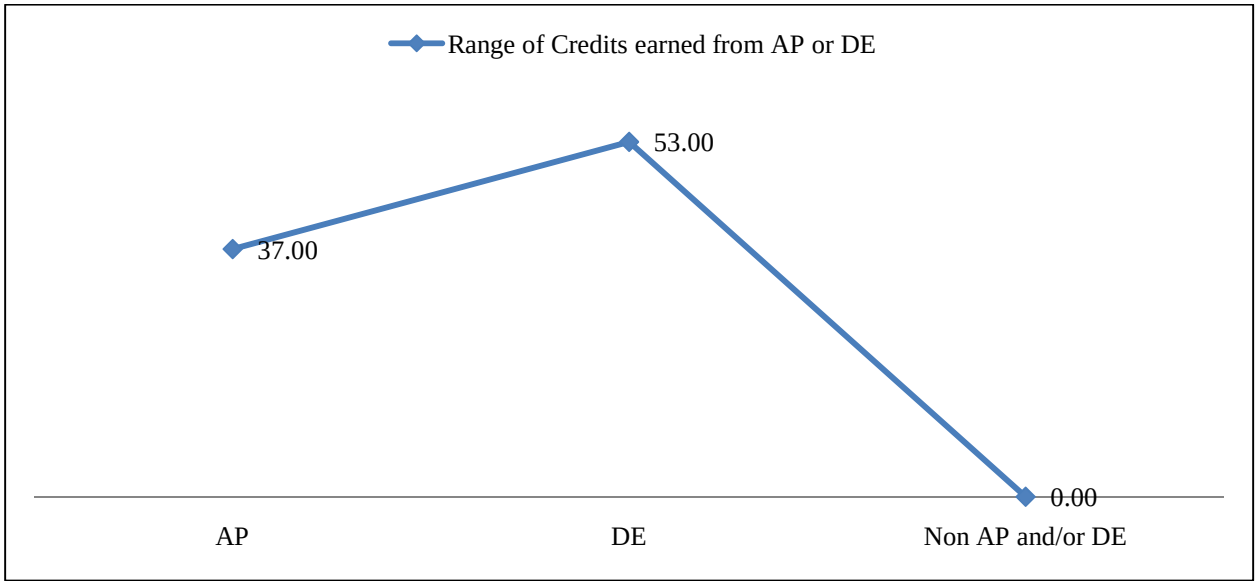

Figure 6. Range in college credits earned by each cohort
Legend: AP and DE cohorts are mutually exclusive. Therefore, students in the AP cohort only earned college credits via their score on an AP examination and students in the DE cohort only earned college credits via a DE experience.

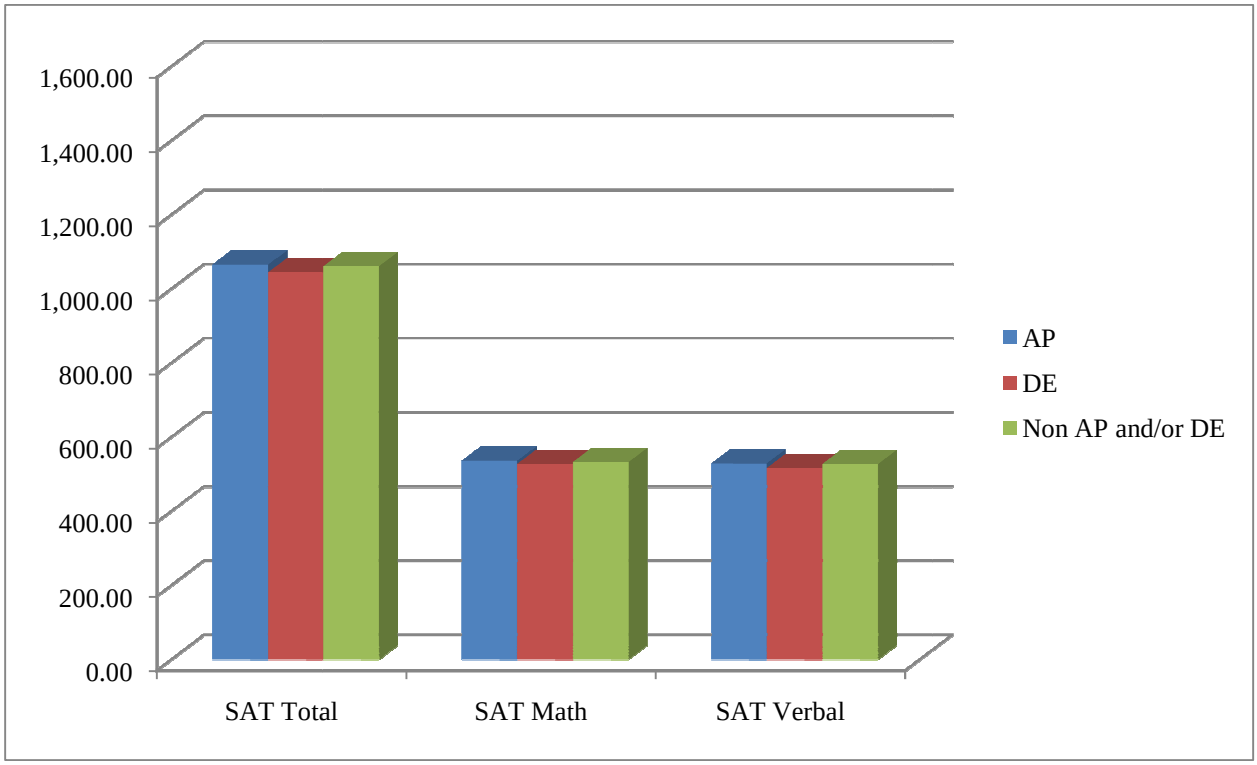

Figure 7. Range in SAT Total, SAT Math, and SAT Verbal scores for each cohort