

**Applied Research Project**

**The Impact of Advanced Placement and Dual Enrollment Programs on College  
Graduation**

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## Abstract

**Purpose:** The purpose of this study is to test whether Advanced Placement (AP) and dual enrollment courses for high school students influence the likelihood of enrolled students graduating from a four-year college or university within six years. **Method:** A total of 3,781 AP and/or dual enrollment students and 2,760 non-AP and non-dual enrollment students were selected for inclusion in the study. A regression analysis was used to test the impact of AP and dual enrollment programs on college graduations while controlling for subject's race, gender, and socioeconomic status. **Results:** Overall, the results showed that taking an AP or dual enrollment course was a significant factor influencing whether a student graduated from a four-year university or college within six years. High income, female, and Anglo students are also more likely to graduate within six years from a four-year university as compared to low income, male, and minority students. **Conclusion:** This research study is only a small step in revealing an incentive for high school students and colleges to find ways for students to graduate sooner and become members of the workforce. AP and dual enrollment courses have enabled high school students to become familiar with college expectations and gain college credit, with this familiarization students are more likely to graduate from college within a timely manner.

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## Chapter 1: Introduction

### Introduction

In the current American educational system, there is a disconnect between what high schools require for graduation and what colleges require before they consider students' admission applications (Greene and Forster 2003, 7). This divide also causes admitted students to be at a disadvantage because they do not have the skills in many cases to be successful in college courses. Without the necessary skills these admitted students have to take remedial classes to bring their skills to sufficient college levels, which in turn lessen their chances of successful graduation from a four-year college or university.

State and federal governments have realized there is a gap in high school graduation and college admission requirements, thus increasing standards that students must meet in order to graduate from high school. Through the No Child Left Behind initiative, the federal government has raised the standards that students must meet to graduate from high school by increasing core coursework requirements. Additionally, the No Child Left Behind initiative linked school funding to the success of students in meeting defined goals.

Two ways to help students toward college readiness is through Advanced Placement (AP) and dual enrollment programs which enable high school students to gain college credit during high school and step forward into the college experience. These programs have been rapidly growing over the past three decades as students and schools realize the benefit of these programs and as states expand funding for these programs (Klopfenstein 2004). While both AP and dual enrollment programs allow high school students to gain college credit, each does it differently. Advanced Placement classes are taught on high school campuses by high school faculty in various disciplines that "mirror" a college course. To gain college credit students take standardized exams developed by the College Board, the governing board of AP, upon

completion of the course. While the attainment of college credit may vary by college, students typically are required to make a 3 or above<sup>1</sup> for a college to grant course credit.

In contrast, dual enrollment allows high school students to take college courses from a local community college or university. Classes can either be taken on the community college or university campus by a professor or taken on a high school campus and taught by a college level instructor who in many cases is a high school teacher who has a Masters or sometimes a Doctorate in that course subject. Students in dual enrollment courses are required to do the same coursework and take the same tests as traditional college students do in order to gain credit for the course. Usually students have to make a grade of “C” or above in order to transfer this college credit to the university that they choose to enroll in after high school graduation.

While these programs have been relatively successful in helping high school students with college readiness, graduation rates from colleges are still low. A study by Greene and Forster (2003) found that only half of those who enroll at four-year institutions obtained a degree. This trend is troubling and indicates that many students are not successfully completing college coursework and graduating in six years or less.

### **Research Purpose**

This research study will look at the graduation of students enrolled in Advanced Placement (AP) and dual enrollment programs. The purpose of this study is to test whether AP and dual enrollment courses for high school students influence the likelihood of enrolled students graduating from a four-year college or university within six years.

This research is important for four reasons. First, many states are looking for ways to increase the number of college graduates entering their workforce. With college enrollments limited by admission numbers, many individuals who are not considered “college ready” by

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<sup>1</sup> Exam scale is 1 to 5, with 5 being the highest score and 1 being the lowest score.

admissions staffs are forced to enroll in community colleges or join the workforce. Thus, many students are looking for ways to gain an advantage over other students to gain admission to the college of their choice. AP and dual enrollment programs are a way students are able to gain a leg up on students who do not take these courses in high school.

Second, with the federal No Child Left Behind initiative and other state initiatives, minimum high school graduation standards have been raised requiring students to take more rigorous classes. AP and dual enrollment courses are considered more rigorous. While there is a rush to implement these courses into high school curriculum, the need must be addressed whether these classes help or hurt students in the long run from ultimately graduating from a four-year university.

Third, colleges are looking for ways to graduate as many students as they possibly can in a timely manner. Many colleges are feeling constraints due to students taking longer to complete their degrees, thus creating a strain on the resources of these universities. In order to get students to complete their degrees in a timely manner, colleges and state legislators are looking for ways to get students to graduate in less than six years which is the average it now takes students to complete their degrees. AP and dual enrollment programs are one option that college administrators and legislators are looking towards to help students graduate faster.

Fourth, while previous studies have been done on AP and dual enrollment programs, studies on student graduation rates have been limited and self-serving because this research mainly was done by individuals with interests in success of these programs. Previous studies done on AP and dual enrollment programs have been descriptive research, thus lacking an empirical element to their findings. Independent empirical studies need to be done to weigh the

effects that AP and dual enrollment courses have on students graduating from a four-year university.

### **Chapter Summaries**

Chapter two introduces previous literature written on Advanced Placement and dual enrollment programs and studies, and more specifically creates a framework of this study through a review of this literature. Advantages and disadvantages of these two programs are presented and discussed, essentially revealing that the available literature is somewhat self-serving due to the lack of independence of the research from the entities that have a stake in these programs.

The third chapter presents the conceptual framework of this study and why formal hypothesis was selected to test the assumptions of this study. This chapter also presents the hypothesis formulated from the reviewed literature.

The fourth chapter introduces the methodology used to address the established research question. An analysis of existing data was selected as the research method. Both the problems and benefits of selecting this method are detailed in this section. This chapter discusses the methods of sampling from the selected population to form a sample of AP and dual enrollment students and non-AP and non-dual enrollment students. The chapter also details how the hypothesis was operationalized. A logistic regression was developed to test the hypothesis.

Chapter five presents the results of the regression study. This chapter explains the significance of the independent variables on the dependent variables. This chapter also provides tables of the tests that were run in order to create the results of the study.



Chapter six summarizes the conclusions drawn from the statistical tests used to create the results of the study. This chapter provides suggestions for future research, as well as thoughts for improvements that need to be made in both programs to create opportunities for all students.

## **Chapter 2: Literature Review**

### **Introduction**

Advanced Placement (AP) and dual enrollment programs have enabled high school students to gain college credit and step forward into the college experience prior to high school graduation. This chapter analyzes and reviews scholarly literature on the trends and benefits of AP and dual enrollment programs. This review presents the problems of AP and dual enrollment programs and how this equates to success in students ultimately graduating from college. Current literature on AP and dual enrollment is somewhat self-serving because those who conduct these programs are also the ones studying the effects of these programs. The literature also shows the disparity in the level of education required for high school graduation and the level needed for college. Many of these studies also do not examine the effect of ultimately using the credits gained through these programs to graduate from a four-year university.

### **Disparity Between K-12 System and Colleges**

A disparity exists between the K-12 system and post-secondary system which creates admission problems. Many students find that they do not meet the requirements of college and therefore cannot apply to specified colleges. This gap occurs because students are required to take certain courses to satisfy curriculum to graduate from high school, but these courses do not meet the criteria that four-year universities look for in order for a student's application to be considered for admission by that college. Using Department of Education data, Green and Forster (2003, 4) found that "only 70% of all students in high schools graduate, and that only 32% of all students leave high school qualified to attend a four-year college."

Many national studies, such as a study by the National Center for Higher Education Management Systems, have duplicated Greene and Forster's findings. The National Center for

Higher Education Management Systems (2000) study found that only 38 out of 100 high school students enter college, with 26 still enrolled in college after their sophomore year. Of these 26 students, only 18 graduated with either an associate's or bachelor's degree within 150 percent of the required degree time<sup>2</sup> (Pennington 2004, 3).

In its report, the National Commission on the High School Senior Year found that “not enough high schools are preparing students for college careers and that while 70 % of today's high school graduates go on to some form of postsecondary education, only one-half of those who enroll at four-year institutions leave with a degree” (Ndura et al. 2003, 21). The trend is not limited to impoverished areas or regions of the United States, such as the southwest or Midwest. Kirst and Venezia (2001, 96) found in the California State University system that “more than two-thirds of regularly admitted first-year students did not meet college-level standards in at least one placement exam.”

### **Why are High School Students Unprepared for College?**

Several factors exist why students who state they intend to graduate from college do not. Bailey et al. (2002) found that after two years 37 percent of students entering college for the first time had left without earning a degree or certificate. They stated one reason is due to students being academically unprepared for higher education (Bailey et al. 2002).

So why are so many students unprepared for the next step in their education? Many theories have been articulated: lack of incentive for students based on their socioeconomic status, quality of student instruction, and opportunities available for students to advance their education. Other factors that contribute to the K-12 and post-secondary disconnect are “access to college-prep courses, grade inflation, placement into remedial-level coursework in college,

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<sup>2</sup> Within three years to achieve an associate's degree or six years for a bachelor's degree.

conflicting conceptions of student assessment, special problems endemic to senior year in high school and lack of early and high quality college counseling for all students” (Kirst and Venezia 2001, 92). However, the primary problem is that college preparation falls solely to the K-12 system which is “ill-suited to carry this burden alone” (Kirst and Venezia 2001, 95). Some have argued that the “open door admission policy” at community colleges, and even at many four-year institutions, gives confusing signals to high school students (Bailey et al. 2002, 2). According to Bailey et al. (2002, 2), while a high school student’s record does little to influence his or her ability to attend college, they fail to understand that this record is strongly related to their post-secondary success once they are in college. Because of this failed understanding students have to take remedial classes that limit the classes they can take during their first semester of college, thus lessening their chances of graduating from a four-year college or university.

Another reason that can be attributed to having to take remedial courses is due to high school faculty who lack the proper knowledge of the level of subject mastery that is required for a student to succeed in college. Kirst and Venezia found that few teachers, counselors, and administrators have knowledge of college admission and placement policies and thus cannot articulate college expectations to students (2001). Problems also occur because high school educators have negative attitudes towards colleges because they feel that college administrators and professors should not dictate their curriculum. According to Nunley et al. (2000) some administrators and teachers do not respect their local community college and are not very open to accepting guidance from these institutions about the skill levels necessary for collegiate success (Garton 2003, 14).

Because of these problems Bailey et al. (2002) have suggested a model of K-14 with the first two years of college being included in high schools. This would be similar to other

educational systems, such as in Germany. Though this idea may be too radical for the American educational system, the underlying problem still needs to be addressed. In order to close this gap, college level expectations need to be more clearly communicated to K-12 stakeholders in order to tie K-12 and college policies together (Kirst and Venezia 2001, 94). Through dialogue and programs such as AP courses and/or dual enrollment, expectations of colleges are more clearly communicated to K-12 stakeholders. Bailey et al. (2002, 2) argue that through communication, secondary and postsecondary schools “will help students understand what they need to know and be able to do to achieve the ambitions that so many have and may motivate students to take their studies more seriously.”

### **Defining Advanced Placement Programs**

In 1954 Advanced Placement (AP) courses were created by John Kemper, headmaster of Andover Academy, in order to address the problem of academically able students repeating courses that they had in high school during their introductory courses in college. The driving ideas behind the program were that many high school students were capable of college-level work, while many high schools had the desire and resources to offer college level courses (Santoli 2002, 25). Standards though were needed to regulate how these courses could translate to college credit. In 1955 the educational sectors were linked through the uniform standards of the College Board set for each academic subject and the issuance of a syllabus to help students get ready for subject-matter examinations (Kirst and Venezia 2001, 92). The College Board still administers AP exams of various subjects that simulate the material that would be covered in an introductory college course and knowledge that is needed in order to show mastery of that course. But other than administering the tests, the College Board has no other influence on how a program is run in a high school.

## Trends and Growth of AP Programs

In 2002, the Academic Excellence Indicator System, by which schools are publicly rated each year in Texas, started considering the number of advanced courses offered (including AP courses) and AP test results in its school evaluations (Klopfenstein 2003a, 116). One reason for the inclusion of Advanced Placement (AP) pupils' scores in the public rating of school districts is the rapid growth of AP programs. While participation has grown among students, AP is also changing because of its growth. More high schools are adopting AP programs, and the College Board is continually expanding the number of AP courses available (Santoli 2002, Klopfenstein, 2003a).<sup>3</sup>

This growth has also occurred due to increases in state and federal funding targeting increased lower income student participation (Klopfenstein 2004) and the increasing competitiveness of college admission<sup>4</sup> (Klopfenstein 2003b). The greater variability of courses also allows for a "higher probability that a student from any racial group will take their first AP course" (Klopfenstein 2004, 120). In Texas, there is no cost to students in an AP course, although there is a fee of \$78 if students wish to take the exam (Klopfenstein 2003a, 116). While Texas generously supplements federal AP subsidies, students at high-poverty and rural schools continue to have limited access to AP courses, and African American, Hispanic, and low-income students remain grossly underrepresented in the AP courses that are offered (Klopfenstein 2004, 10). Klopfenstein also found that predominantly Hispanic and African American schools offered

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<sup>3</sup> Juniors and seniors were the primary participants of the first AP courses, but now 9th and 10th graders are being included as well (Santoli 2002, 27).

<sup>4</sup> One interesting finding in Klopfenstein's study is that in Texas AP course availability increased for all demographic groups, but students attending low income and rural schools still had less access to classes in 2000 relative to their wealthier, non-rural counterparts. But in contrast she found, schools serving large African American or Hispanic populations provided AP courses comparable in number to predominantly Anglo schools both before and after the funding changes (Klopfenstein 2004, 3).

a comparable number of AP classes to predominately Anglo schools, students in these racial classes are not enrolling in these classes.

But while AP is fundamentally targeted at all students, according to Klopfenstein (2003b), AP should only be attempted by goal-oriented, motivated, and capable students who want to gain college credit. This idea creates challenges for those students who do not have the support or resources to be one of these students.

### **Benefits of AP Courses**

The inclusion of Advanced Placement (AP) courses has immediate benefits for those students choosing to enroll in AP. The academic culture provided by an AP programs can be particularly beneficial to minority students who may not be exposed to a culture of learning in other places (Klopfenstein 2003a, 115). College and university admissions officers look favorably upon AP course experience, and most schools grant college credit to those students who earn passing scores on AP exams<sup>5</sup> (Klopfenstein 2003b). According to Klopfenstein (2003a, 116), taking an AP course signals to college and university admissions officers that a student is prepared for college level work, whether or not he/she takes the AP exam. Klopfenstein (2003a, 115) also sees AP experience as not only a useful screening device for college admission, but the experience also improves retention by serving as strong college preparation. An encouraging statistic for students is that AP scores have a greater predictive weight than any other factor except high-school grades (Geiser and Santelices 2004, 18). Students can be motivated by the fact that if they are successful in their AP classes they are more likely to be college level ready.

Supporting this notion of college readiness, Willingham and Morris found that the college dropout rate for AP students over four years was significantly lower, 15% as compared

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<sup>5</sup> 3 or higher

with 25% for non-AP students (Santoli, 2002, 28). AP students are more college ready because of the program and do stay in school and complete their bachelor's degree. According to the College Board (2003), studies have shown that AP students are more likely to maintain a high grade point average and graduate from college with honors than their college classmates of similar ability, and are more likely to take additional college courses within the discipline of their AP coursework

### **Problems in AP Programs**

While Advanced Placement (AP) has been seen as being successful in getting students college ready, there are many criticisms of the program. A common misconception is that AP curriculum for courses cover too much, "sacrificing depth of coverage for breadth," and because of this view students are "prevented from achieving the primary goal of advanced study" (Klopfenstein and Thomas 2004, 4). Without this depth students are at a disadvantage because they actually have not gained the same knowledge that would be taught in a college classroom. Klopfenstein and Thomas (2004, 13) feel that students who took these popular courses are no better prepared on average for the "academic rigors of college" than their non-AP counterparts. While the "AP experience may serve as a signal of high ability and motivation, it does not by itself indicate superior academic readiness" (Klopfenstein and Thomas 2004, 14).

High schools and their teachers have also been criticized because of a perceived lack of rigor in their AP classrooms. This criticism is partially based on the belief that the average quality of AP courses may be diminishing due to a shortage of teachers who have the college level background to teach the particular AP subject they are instructing (Klopfenstein 2003a). Schools are also criticized because they have complete autonomy in deciding who teaches AP courses and in many cases new AP teachers frequently find themselves learning the material



along with their students (Klopfenstein, 2003b). This criticism can also be attributed to state laws and other policies which have required the expansion of AP programs in schools without worrying about potential problems of financial and human risk that could possibly compromise the quality and value of AP programs (Klopfenstein and Thomas 2004). An AP course can only be as strong as the knowledge that is being taught to a student. Without substantial knowledge of the college level of a subject a teacher cannot appropriately teach a college level course to students wanting college level credit. Further research is needed in this area, but this is not easily tested since AP scores are not necessarily a reliable measure of AP course quality (Klopfenstein 2003a, 116). One current way the College Board is addressing course quality is through the "AP Course Audit" which simply specifies a set of expectations established by college and university faculty for college-level courses and courses that meet or exceed these expectations will be authorized to use the "AP" designation for the 2007-2008 school year (College Board 2007).

Other problems with AP programs are that participation is still skewed along socioeconomic and racial lines (Geiser and Santelices 2004, Klopfenstein 2004). Current research of AP programs is also flawed because individuals who have a stake in the outcome of the studies have conducted this research. Klopfenstein and Thomas (2004, 2) found that "research from the College Board and Educational Testing Services is fundamentally flawed because it fails to account for the nature of the typical AP student, one who is particularly bright and motivated and likely to experience positive outcomes even in the absence of AP experience."

Previous research has also failed to look at individual characteristics of students. Such research includes the absence of accounting for student ability, academic participation, and

family income, which Klopfenstein and Thomas (2004, 6) found to be positively correlated with both AP participation and college success, resulting in a potentially large positive bias on the AP effect.

### **Dual Enrollment Programs**

Dual enrollment programs have not been around as long as Advanced Placement (AP) programs, but have the same goal in helping students become college ready and gain college credit. These programs often called “concurrent enrollment” or “dual enrollment” programs, have existed for over thirty years, and have seen their enrollments increase rapidly recently (Bailey et al. 2002, 5). Dual enrollment programs expose high school students to advanced courses not offered at their high school. Through concurrent enrollment high school students enroll in a college course prior to high school graduation, giving them first-hand exposure to the requirements of college-level work while gaining high school and college credit simultaneously (Bailey et al. 2002, 5). The cooperation between high school and colleges helps in creating the academic rigor needed for students to be successful, as Pennington (2004) has advocated.

Students in dual enrollment courses do the same coursework and take the same tests as traditional college students do in order to gain credit for the course. Usually students have to make a grade of “C” or above in order to transfer this college credit to the university that they choose to enroll in after high school graduation, entailing a more certain award of college credit than taking an AP exam (O’Brien and Nelson 2004, 5).

Dual enrollment programs are state funded and run by the high school and community college. In some states “legislation requires the state or local school district to pay students’ tuition at the college they are enrolled in, while others compel students to pay their own tuition

and fees, and still others allow funding decisions to be made at the local level” (Bailey et al. 2002, 9). Currently there is no uniform way to fund dual enrollment programs because of how some states pay schools based on the number of students that are enrolled in their school. Some states allow both the high school and the college to count dual enrollment students as part of their full time equivalent (FTE) when calculating state financial support, while others allow colleges to charge fractional FTEs for dual enrollment students (Bailey et al. 2002, 9).

### **Benefits of Dual Enrollment Programs**

Dual enrollment programs are “seen as a way to encourage students who might otherwise ‘slack off’ to engage in demanding coursework during their final year of high school” (Bailey et al. 2002, 9). This motivational factor can work for all students due to the adaptability of dual enrollment programs to serve various levels of achievers can that traditional advanced programs may ignore. While students are gaining credit for high school graduation, this also helps in improving a student’s chances of graduating from college sooner than their non-dual enrollment peers. O’Brien and Nelson found that dual enrollees were more likely to earn their degree sooner (2004, 20).

The environment of dual enrollment programs also acts as an intermediate step between high school and a four-year college or university. Taking college courses while still in the supportive structure of high school helps students understand and experience the demands of college (Pennington 2004, 15). Such an environment also helps in providing students with the realization that they may still have work to do in order to be ready to achieve in a college course. While the program can physically help students make steps toward college, it can also help individuals make the psychological transition. This is accomplished because many (though not all) dual enrollment programs include time on campus and exposure to the non-academic side

of college giving students a realistic expectation of what college is like after high school graduation (Bailey et al. 2002, 7).

Dual enrollment programs also create financial benefits because of its relatively low costs for students and schools. One way for colleges to do this is through hiring high school instructors who have a Masters degree in that particular subject to teach courses on the high school campus and pay them an adjunct rate (Bailey et al. 2002). Dual enrollment programs can also help prevent students from finding out too late that they do not want to do all the work that is required in college. Through dual enrollment programs, expensive false starts in college can be avoided, “as a dual enrollment experience may show some students that college, at least at this time, is not for them” (Bailey et al. 2002, 7). Dual enrollment can also reduce the financial commitment that students and their parents have to make for college once they graduate from high school, with many seeing this as an opportunity to help with the rising costs of college tuition as well as other benefits (Garton 2003).

### **Problems in Dual Enrollment Programs**

Elmers and Mullen (2003) found that when holding academic ability constant there is a null effect in college success between dual enrollment and non-dual enrollment students<sup>6</sup> (2003, 11). Questions of rigor and quality of programs have also surfaced. Some of the fear is that “some models of dual enrollment, particularly those models that do not involve courses on a college campus, differ little from traditional high school coursework” (Bailey et al. 2002, 14). Other fears lie in the fact that quality and rigor of courses are compromised due to admission of high school students to classes which may be changed to adapt to a student’s lack of knowledge of the subject (Bailey et al. 2002). These concerns about quality, rigor, and the maintenance of

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<sup>6</sup> Students earning dual enrollment credit while in high school do not appear to do significantly better than other students who enter college with no dual enrollment credit, but students who take dual enrollment credit do not appear to do worse than students who entered with no previous college credit (Elmers and Mullen 2003, 11).

college-level standards within dual enrollment courses have led many states and educational institutions to require that dual enrollment students meet at least minimum academic requirements (Bailey et al. 2002, 9).

Because of the rise of dual enrollment program popularity, other problems have been brought about because communities are rushing to offer dual enrollment programs to their students. These programs are growing in an “ad hoc” way, and because of this they are not reaching individuals who are least likely to continue on to college, “nor are they being shaped intentionally to significantly increase the numbers of students who complete education credentials beyond high school” (Pennington 2004, 2). Funding of the programs is also problematic because of dual enrollment popularity. In states in which both colleges and high schools receive some funding based on enrollments, it appears that the state is paying twice for the same dual enrolled students (Bailey et al. 2002, 13). States calculate funding based on per pupil for each school and since a student is counted at each school the state pays twice for this student. This problem will need to be addressed as dual enrollment programs continue to expand and allow more students into their courses. Decisions regarding the most appropriate funding mechanism though must “reflect states’ goals for the programs and also take into account unintended consequences” such as reducing incentive for lower income students and discouraging high schools from offering these programs (Bailey et al. 2002, 13).

### **AP and Dual Enrollment’s Null Effect**

Current research has found that Advanced Placement (AP) and dual enrollment programs do not create the performance effect that supporters have advocated. Geiser and Santelices (2004, 18) found in their study that AP and other courses actually have little or no relationship to the performance of students in their later college years. Other criticism is that dual enrollment

programs are actually pushing students away from AP classrooms and towards college or junior college classrooms, which is undesirable to the extent that AP classes provide more classroom hours and assignments, continual monitoring of progress, a standardized curriculum, and smaller class sizes than comparable college classes (Klopfenstein 2003b, 44). Dual enrollment courses can also be disadvantageous because of the programs that students take. Garton (2003, 21) looked at the business classes high school students took and why they were taking college courses.<sup>7</sup>

Results of Garton's study discount the effectiveness of dual enrollment programs by showing courses that may not transfer to another institution, but does not necessarily advocate that AP programs are better. AP program's popularity though is starting to wane with policymakers because of the rationale that AP's likely efficacy in reducing the time and cost toward a degree is weaker than that of dual enrollment (Pennington 2004, 14).

### **Are there Differences in AP and Dual Enrollment Student Success in College?**

Some research studies have found that students in dual enrollment programs are better prepared to graduate from college, while others have found the opposite. According to Elmers and Mullen (2003, 4), students coming in with AP only or both AP and dual enrollment credit do better and earn more hours than other students by the end of their first year of college work. There is more evidence that dual enrollment students do perform better than their AP counterparts.

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<sup>7</sup> Garton used a descriptive model to look at students attitudes toward attending college courses, how dual enrollment courses were marketed to students, the GPA requirements for enrolling in courses, the admission process, and how much of a student's decision is based on cost savings in courses historically taken at Ozark Technical Community College by students. The courses used for the study were Keyboarding, Records Management, Introductory Accounting, Using Business Calculators, Machine Transcription, Business Basics, Customer Service, Business Communications, and related topics in the area of business education.

O'Brien and Nelson (2004, 17) found that dual enrollees have an advantage over AP because these students are more likely than AP takers to graduate in four, five, or six years. This advantage is not localized based on region or school district. O'Brien and Nelson (2004, 18) also found that dual enrollees have an advantage over AP takers when they are compared with all students, within major central cities or suburbs, in the same school district or attending the same high school campus as seniors. While AP and dual enrollment research has been beneficial in trying to further advocate the advantages of the two college preparatory programs, many flaws still exist before advocating that every college bound high school student should be enrolled in one of these programs.

Relatively few studies have examined how well students with AP credit and/or dual enrollment credit do in college in contrast to students who enter with no college credit (Elmers and Mullen 2003, 3, Bailey et al. 2002). While even fewer studies have looked at longer-term outcomes, such as the time it takes for participants to earn their college degree as compared to other students (Bailey et al. 2002). Bailey et al. (2002) found that the most serious methodological problem involves selection, as many programs require students to be academically successful prior to admission. Because of this, "it is hardly surprising that dual enrollment students enroll in postsecondary education and have greater success there than a more typical group of students" (Bailey et al. 2002, 14). According to Pennington (2004, 2), "The challenge is to build on these promising trends to create the education system of the future, one in which most students graduate from high school ready for college and go on to earn a postsecondary credential, while attainment gaps by race and income are eliminated."

### **Are Minority and Low-Income Students Disadvantaged by these Programs?**

Options like dual enrollment and advanced placement have been less effective in increasing the college success of underrepresented groups and promoting the more rapid completion of postsecondary credits by larger numbers of these students (Pennington 2004, 14). The current educational system “denies both mainstream and minority students’ opportunities to develop the cultural capital they need to transform society,” by continuing the inequitable social cycle as minorities are continually unprepared for college (Ndura et al. 2003, 33).

Minority students are disadvantaged due to lack of resources and encouragement to take advanced classes to be prepared for higher education. Low income, African American and Hispanic students often fail to enroll in AP and dual enrollment classes because they lack the academic preparation necessary to undertake college-level work<sup>8</sup> (Klopfenstein 2004, 10, Klopfenstein 2003b, Allen 1999). Efforts to increase enrollments of socially and economically disadvantaged students in AP have just been recently made by the federal government through new funding initiatives (Ndura et al. 2003), although this funding has failed to address this issue (Klopfenstein 2004). The disparity of minority preparedness cannot and will not translate to success without encouragement and programs to help minority students gain the skills needed to succeed in advanced classes and ultimately in college. When minority students do take AP courses they are usually not rigorous courses such as math and science. Klopfenstein (2003a, 123) found that when trying to describe the diversity of a school’s AP curriculum it reveals that African American and Hispanic students of both genders actively avoid AP math and science classes.

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<sup>8</sup> Klopfenstein found that “African American males are predicted to participate in AP at approximately half the rate of Anglo males, and African American females fare slightly better but still participate at between 60 and 70 percent of the Anglo female rate regardless of income. Minority groups also have opposing trends with Hispanic females being less likely to take an AP course than African American females, while Hispanic males are slightly more likely than African American males to enroll” (2003a, 121).



While minority students shy away from AP classes, Asian and Anglo students are clearly recognizing the advantages of dual enrollment (O'Brien and Nelson 2004, 7). These students have identified the benefit of gaining college credit while in high school and gaining the skills necessary to succeed in college. O'Brien and Nelson (2004, 15) found in their study that African American students comprise a higher proportion of AP takers than of African American students who are concurrent enrollees, because schools in the study that were least involved in dual enrollment had the highest concentrations of minority and low income students. This can be due to other factors, which other studies have discovered.<sup>9</sup>

### **Conclusion**

Dual enrollment and Advanced Placement courses have enabled high school students to become familiar with college expectations and gain college credit. There are many problems that each program presents, but the advantages outweigh any critical problems. Racial and socioeconomic issues need to be further incorporated into federal and state policy in order for these programs to reach students who may not otherwise receive the instruction in order to prepare them for higher education. Funding issues from state and federal governments also need to be addressed in order to provide for the demand and maintain the quality of each program. In order to successfully measure outcomes of these programs, research needs to couple students taking AP and/or dual enrollment courses to look at whether these programs are truly helping these students achieve the ultimate outcome of college graduation compared to students who did not participate in either program while in high school.

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<sup>9</sup> Klopfenstein incorporated geographic differences in her study. She found that most Anglo students attend school in large suburban areas, which are expected to sustain a culture that values college more than other areas, while African American students are heavily represented in large urban areas and Hispanic students being fairly evenly distributed between large urban and large suburban areas (2003a, 121).

## Chapter 3: Conceptual Framework

### Chapter Purpose

This chapter will develop the reasoning for selection of formal hypothesis to be used in this study. The conceptual framework of this study is presented in this chapter with links to the supporting literature. The chapter also discusses the development of the hypothesis.

### Conceptual Framework

This study is explanatory research using a formal hypothesis to look at the effectiveness of AP and dual enrollment programs in creating college ready students.<sup>10</sup> Explanatory and formal hypothesis are the mainstay of social and policy sciences addressing the “why” question (Shields 1998). The “why” question looks at causation, X causes Y, and uses dependent and independent variables to test this causation (Shields 1998). One hypothesis, controlling for demographic variations, will be employed in this study. Table 3.1 presents the hypothesis to be tested and the supporting literature used to develop this hypothesis.

**Table 3.1: Linkage of Formal Hypotheses for Advanced Placement and Dual Enrollment Programs to Literature Sources**

<b>Formal Hypothesis</b>	<b>Supporting Literature</b>
Students who take Advanced Placement and/or dual enrollment courses in high school are more likely to graduate from a four-year university <sup>11</sup> in six years than students who did not take these courses, controlling for demographic variations.	Kirst and Venezia 2001, Elmers and Mullen 2003, O’Brien and Nelson 2004, Klopfenstien 2004, Klopfenstein 2003a, Klopfenstein 2003b, Greene and Forster 2003, Klopfenstein and Thomas 2004, Pennington 2004, Santoli 2004, Adelman 1999

Advanced Placement (AP) and dual enrollment programs do create significant benefits for students to be successful in college. Studies have found that AP and dual enrollment students do better and earn more credit hours than other students by the end of their first year of college,

<sup>10</sup> Students that understand the rigors of college and are able to succeed once they enroll in college courses.

<sup>11</sup> The term “four-university” includes universities and colleges that offer bachelor’s degrees.

and are more likely to return for their second year of college (Elmers and Mullen 2003). There are many similarities that are shared by AP and dual enrollment students. O'Brien and Thomas found that dual enrollment students share many of the academic advantages of students who take AP courses (2004, 3). While each program helps prepare their students for college, there is debate and disparity which program is more beneficial in terms of these students graduating from college. Although some research has found that students who take both AP and dual enrollment courses while in high school are more likely to graduate sooner in four to six years than students who took just AP or dual courses (O'Brien and Nelson 2004).

Some research studies have found that students in dual enrollment programs are better prepared to graduate from college, while others have found the opposite. According to Elmers and Mullen (2003, 4), students coming in with AP only or both AP and dual enrollment credit do better and earn more hours than other students by the end of their first year of college work. Currently, there is more evidence that dual enrollment students do perform better than their AP counterparts.

O'Brien and Nelson (2004, 17) found that dual enrollees have an advantage over AP, because these students are more likely than AP takers to graduate in four, five or six years. This advantage is not localized due to region or school district. O'Brien and Nelson (2004, 18) also found that dual enrollees have an advantage over AP Takers when compared with all students, within major central cities or suburbs, in the same school district or attending the same high school campus as seniors. While this research has been beneficial in comparing the two college preparatory programs it still has problems.

Little research has looked at longer-term outcomes, "such as the time it takes for participants to earn their college degree, as compared to other students" (Bailey et al. 2002).

While students in these programs typically do continue on to postsecondary education after high school it is somewhat not surprising due to the current trends. According to Bailey et al. (2002), AP and dual enrollment have a distinct advantage over students not in these programs which should correlate to more success for AP and dual enrollment students.

Thus this study expects to find that:

*(H<sub>1</sub>) Students who take Advanced Placement and/or dual enrollment courses in high school are more likely to graduate from a four-year university in six years than students who did not take these courses, controlling for demographic variations.*

Klopfenstien (2003a) found in her studies African American and Hispanic students attend college at lower rates than Anglo students and AP offerings at schools with a large percentage of African American and Hispanic students are lower than those at predominantly Anglo schools. The racial disparity exists mainly due to the lack of access that these students have to these programs and the lack of parental support at home that many Anglo and Asian students enjoy in order to take advanced classes in order to prepare for college. The lack of access provides a small sample of minority students who are able to enroll in these advance level classes. And because of this lack of access problem the minority students that do take advantage of AP and dual enrollment courses usually do not receive the same quality of instruction as Anglo and Asian students to prepare them for the skills they will need in order to graduate from a four-year university.

While race diminishes AP and dual enrollment participation and college attendance, low-income status also reduces student participation in AP and dual enrollment programs. While this spans all races, African American and Hispanic students according to Klopfenstien (2003) are three times more likely to be considered low income than Anglo students.

These students (low income) “typically have diminished access to a culture of learning that establishes expectations for attending college and leads students to not pursue a high school curriculum rigorous enough to achieve this goal” (Klopfenstien 2003, 118). With diminished opportunities these students in many cases do not have the skill set to succeed in college or the support of their family. Their families usually consist of parents who do not have a college degree and in many cases a high school diploma. In contrast, well-educated parents usually are more likely to instill the advantages of a college education and can pay for a college education for their children (Klopfenstien 2003, Ndura et al. 2003). Well-educated parents also advocate for a more challenging curriculum in their child’s schools and have the political power to see that they get it for their students (Ndura et al. 2003).

Prior studies have found that students who are economically disadvantaged are less likely to earn a bachelor’s degree in four, five or six years (O’Brien and Nelson 2004). The distinct disadvantage of low-income status reflects why many poorer schools do not offer rigorous classes for their students to take.

Student participation in AP and dual enrollment programs is also divided among genders. Based on Texas Education Agency data, females take advantage of AP programs more often than males (Klopfenstien 2003). This gender gap in AP participation is consistent with the gender gap in high school and college graduation rates, but the reasons behind these trends are unclear according to Klopfenstien (2003,117).

Based on the above findings, race, gender, and socio-economic status will be used as controlling variables to account for demographic variations.

## **Chapter Summary**

This chapter developed the reasons that formal hypothesis was selected for this study. The conceptual framework developed from the reviewed literature was also presented in this chapter, along with the hypothesis formulated from the literature to be tested for this study.

## Chapter 4: Methodology

### Chapter Purpose

This chapter will describe the steps taken to test the hypothesis of this study. This chapter will also describe the methodology used to test the research purpose of this study. It discusses the methods used to create the study’s sample, as well as describes the statistical methods used to test the hypothesis.

### Research Technique

The research method selected in order to test the study’s hypothesis was analysis of existing data. This data was taken from the National Education Longitudinal Study: 1988-2000 Data, which comprises individual student data were collected by the Institute of Education Sciences, U.S. Education Agency. Table 4.1 shows how the hypothesis in this study was operationalized.

**Table 4.1: Operationalization of Hypotheses**

Variable	Units of Measurement	
<b>Dependent Variable:</b> Graduation	1 = Yes, graduated within the six year period	0 = No, did not graduate within the six year period
<b>Independent Variables:</b>		
1. Took AP/Dual Enrollment Classes	1 = Yes	0 = No
2. Minority	1 = Minority <sup>12</sup>	0 = Anglo
3. Low Income	1 = Yes <sup>13</sup>	0 = No
4. Gender	1 = Male	0 = Female

Using existing data creates problems of validity and reliability. Babbie (2004) suggests handling problems of validity through the use of logical reasoning and replication. This study handles validity challenges by using data collected by the Institute of Education Sciences, U.S.

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<sup>12</sup> Minority includes Asian/Pacific Islanders, African Americans, Hispanics, and Native Americans.

<sup>13</sup> Parents made less than \$25,000, base on the federal poverty level in 1992 for a family of four.

Education Agency and ensuring that complete information for each variable is available for each research subject included in the study. The data collected by the Institute of Education Sciences was done through survey questionnaires of students beginning in eighth grade in 1988 with follow-up questionnaires in 1992, 1996, and 2000. Because information is being collected by questionnaires, the information is limited by the correctness of the response of the student to the survey. Usage of government statistics in this study also creates a reliability problem which Babbie (2004) feels is a substantial problem considering that in most cases government statistics are inaccurate. Problems of reliability must be acknowledged in the collection of the data in this study in order to create the first protection of reliability that Babbie (2004) refers to. In order to offset this challenge the information provided was investigated so that the researcher can assess the nature and degree of the unreliability in order to measure the potential impact that this may have on the research (Babbie 2004). Broad statements about the results were made in instances where there is not specific data available on aspects that the researcher wants to be explored in the study, such as religion in Emile Durkheim's study on suicide rates of Protestant and Catholics (Babbie 2004).

### **Development of Sample**

The National Education Longitudinal Study consisted of 12,144 students surveyed. Each student was surveyed beginning in 1988 with four follow-up surveys (1990, 1992, 1996, and 2000) as they progressed in their schooling and into the workforce.<sup>14</sup> Each different survey asked various questions about the classes each student was taking, including whether a student was taking AP or dual enrollment courses. The questionnaires also asked about the students plans after high school graduation whether they would enter the workforce or continue on to college. Demographic data was also collected through each survey.

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<sup>14</sup> Each student graduated from high school in 1992 or 1993.



Using the data collected from The National Education Longitudinal Study: 1988-2000 Data, information from the surveys was pulled on each subject's race, gender, whether they took an AP class, whether they took a dual enrollment class, whether they graduated from a four-year university within six years, and parent's socioeconomic status. After the pertinent information for this study was pulled, students were coded with a "1" if they took an AP or dual enrollment course in high school and coded with a "0" if they did not take one of these courses in high school. Students who took either an AP or dual enrollment course were then combined into one variable to look at the singular effect that advanced programs had on college graduation. Overall, 5,338 students responded they took AP and/or dual enrollment courses, while the remaining 6,806 students did not. Each student was also coded with a "1" if they were continued on to a four-year university<sup>15</sup> and "0" if they were not continuing on to a four-year university or college. Table 4.2 depicts the percentage of students who were and were not college bound from the AP and/or dual enrollment sample and the sample of students who did not take these classes in high school. Based on this coding 3,781 AP and dual enrollment students indicated they were continuing on to a four-year university, while 2,760 non-AP and dual enrollment students indicated they were continuing on to a four-year university. Overall, 7 out of 10 students who took AP and/or dual enrollment courses in high school were college bound, compared to nearly 41 percent (40.55%) of students who did not take these courses while in high school.

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<sup>15</sup> Enrolled and attended a four-year university or college.

**Table 4.2: Percentage of Students College Bound<sup>16</sup>**

	<b>College Bound Yes</b>	<b>College Bound No</b>
Took AP/Dual Enrollment Courses	70.83%	29.17%
Did Not Take AP/Dual Enrollment Courses	40.55%	59.45%

The 6,541 students who indicated they were continuing on to a four-year university were used to test the hypothesis of this study. Demographic distribution of the sample is presented in Table 4.3.

**Table 4.3: Demographic Distribution**

<b>Race</b>	Minority	28.54%
	Anglo	71.46%
<b>Low Income</b>	Yes <sup>17</sup>	29.66%
	No	70.34%
<b>Gender</b>	Male	46.93%
	Female	53.07%
<b>Graduated within six years</b>	Yes	57.25%
	No	42.75%

The dependent variable in this study is whether a student graduated within the six year period starting when the student enrolled after high school. The independent variables used in this study were each subject's race, gender, whether they took an AP class and/or a dual

<sup>16</sup> Enrolled and attended a four-year university or college.

<sup>17</sup> Parents made less than \$25,000, base on the federal poverty level in 1992 for a family of four.

enrollment class, and parent's socioeconomic status. Using this data, a logistic regression model is used to test the effect that each independent variable had on the dependent variable of whether they graduated from college within six years. Employment of this method allowed for each variable to be weighed simultaneously against the dependent variable.

### **Human Research**

This research study (HSP 0302727) includes individual data collected on high school and college students who participated in the surveys done by the Institute of Education Sciences, U.S. Education Agency and compiled into the National Education Longitudinal Study: 1988-2000 Data. Student data on students was recorded in to the database without names and personal identification numbers.

The potential risk of students being harmed by dissemination of this information is very limited since there was no personal interaction between the researcher and the subject. The subject in this study is just a number and their academic performance cannot be linked back to them since there are no identifying factors other than their race and gender.

### **Chapter Summary**

This chapter presented the methodology for testing the hypothesis. The 12,144 students surveyed were pared down to 6,541 students based on each student indicating that they were continuing on to a four-year university after high school. A total of 3,781 AP and dual enrollment students were included in this group with the remaining 2,760 students coming from students that did not take these courses while in high school. A logistic regression model is used to test the hypothesis of this study. Three demographic covariates are included in the regression.

## Chapter 5: Results

### Chapter Purpose

This chapter presents the findings of this study. A logistic regression was used to test the hypothesis that Advanced Placement (AP) and dual enrollment students are more likely to graduate from a four-year university within six years. The results of this study are presented in a tabular format. They are also summarized and interpreted in the text.

### Logistic Regression Results

A logistic regression was used to predict whether college graduation from a four-year university within six years was affected by whether the subject took Advance Placement (AP) and/or dual enrollment courses in high school, controlling for subject's race, gender, and socioeconomic status. Table 5.1 shows that taking an AP and/or dual enrollment class in high school was a significant predictor as to whether a student will graduate from a four-year university within six years, controlling for race, gender, and socioeconomic status.

**Table 5.1: Logistic Regression**

<b>Variable</b>	<b>B</b>	<b>Significance</b>	<b>Exp (B)</b>
Gender	-0.292	0.000	0.747
Low Income	-0.573	0.000	0.564
AP and Dual	0.716	0.000	2.046
Race	-0.448	0.000	0.639

Based on the results of the data analysis, AP and dual enrollment courses increased the odds of a student graduating from a four-year university within six years by a factor of 2.05, controlling for race, socioeconomic status, and gender. This finding is not too surprising, as the

few empirical studies conducted on AP and dual enrollment programs have reported similar findings. The results of this study show AP and dual enrollment students are twice as likely to graduate within six years which indicates that each program may help in creating college ready students. However, it should be noted that most of the students enrolled in either program are typically bright and highly motivated students who would likely succeed in college with or without instruction in either program (Klopfenstein and Thomas 2004). High income, female, and Anglo students are also more likely to graduate within six years from a four-year university as compared to low income, male, and minority students.

### **Conclusion**

This chapter described the results of this logistic regression study. The hypothesis that students who took Advance Placement (AP) and/or dual enrollment courses in high school are more likely to graduate from a four-year university within six years than students who did not take these courses, controlling for demographic variations, was supported. This finding supports O'Brien and Nelson's (2004) findings that AP and dual enrollment students are more likely to graduate from a four-year university within six years than students who did not take these courses in high school.

This study also showed that minority students are less likely to graduate from a four-year university within six years than Anglo students. Higher socioeconomic students are also more likely to graduate from a four-year university within six years than lower socioeconomic students. Both these findings support Klopfenstein's (2003a) and O'Brien and Nelson's (2004) findings that minority students and lower socioeconomic students are less likely to graduate from a four-year university.

This study also revealed that female students were more likely to graduate from a four-year university within six years than male students. This finding supports Klopfenstein (2003a) findings that there is a gender gap in college graduation rates between male and female students.

## Chapter 6: Conclusion

### Research Summary

The purpose of this study was to test whether Advanced Placement (AP) and/or dual enrollment students were more likely to graduate from a four-year university within six years than students who did not take these courses. The first chapter of this study introduced the topic of research.

Chapter two introduced previous literature written on studies of AP and dual enrollment programs. Advantages and disadvantages of these two programs were presented, essentially revealing that this literature is somewhat self serving due to the lack of independence of the research from the entities that have a stake in these programs. Through the analysis of literature a framework for this study was constructed.

The conceptual framework of this study was presented in the third chapter. This chapter also presents the hypothesis formulated from the reviewed literature, controlling for demographic variations.

The fourth chapter introduced the methodology used to address the research question. An analysis of existing data was selected as the research method, both the problems and benefits of selecting this method were revealed in this section. This chapter disclosed the methods of selecting the subjects used in this study. A logistic regression was developed to test the hypothesis, while controlling for demographic variations.

Chapter five presented the results of this regression study. The results of this regression test revealed that AP and dual enrollment courses are a significant predictor in terms of students who took these courses being more likely to graduate from a four-year university than students who did not take these courses in high school.

### **Benefits of Study Findings**

This research study is only a small step in revealing an incentive for high school students and colleges to find ways for students to graduate sooner and become members of the workforce. However, this study is beneficial to the study of AP and dual enrollment programs because it is one of the few studies to analyze college graduation and AP and dual enrollment programs through empirical analysis instead of doing a descriptive study as most research on this topic has been.

This study found that students who take AP and/or dual enrollment courses are more likely to graduate from a four-year university within six years than students who did not take these courses. One caveat that must be included with this finding is that students that take these programs are usually bright and highly motivated students that would do well in college with or without taking either programs if AP or dual enrollment courses in their high schools (Klopfenstein and Thomas 2004).

### **Suggestions for Future Research**

Academic ability needs to be accounted for when assessing the effects that Advanced Placement (AP) and dual enrollment programs have on college graduation rates of students. Relatively few studies have examined how well students with dual enrollment credit and/or AP credit do in college in contrast to students who enter with no college credit, when academic ability is controlled (Elmers and Mullen 2003, 3). Controlling for academic ability will allow for measurement of the ability of students in AP and/or dual enrollment programs versus students that did not take these courses while in high school. One way to control for academic ability is the usage of ACT and SAT scores of students, as O'Brien and Nelson (2004) employed in their study. A potential problem with this approach is due to the limited amount of data that is



available on this topic. Data involving students' personal information is required by law to be kept confidential; therefore, generally is not widely available.

Another problem with this type of data is the fact that this information has to be matched from high school to college which is two different spheres in itself. In order to gain corresponding information for a student's high school record and college record one must find a source that is able to match this information together, such as the Texas Schools Microdata Panel which partners with the Texas Higher Education Coordinating Board and the Texas Education Agency, or through a survey as was done by the Institute of Education Sciences, U.S. Education Agency used for this study. Unfortunately, the source used for this study did not have any academic factors that could be used to determine academic ability.

A limitation of this study is that AP and dual enrollment programs were analyzed by combining the data for both together, rather than separately. By separating the students that took AP courses and/or dual enrollment courses the possible effect that each program has on college graduation may be able to be determined further.

Looking at individual programs to determine if these programs are beneficial at a local level may also strengthen future research on this topic. By looking at these elements one is able to test whether the AP and dual enrollment programs in their school district are actually successfully creating the skills that students need in order to succeed in college. This type of research could be beneficial for school districts wanting to assess their current programs in terms of whether one program is preparing students better than the other. Since funding can be an issue, a review of advanced programs within schools could be beneficial in looking at whether one program is superior to another. This could allow schools with limited funds to focus on the

program deemed superior in preparing their students for the rigors of college and only offer that program to it's students.

### **Future Direction of Research**

While Advanced Placement (AP) and dual enrollment programs help provide viable solutions to create students prepared for the rigors of college, there are many problems that need to be addressed in each program. Racial and socioeconomic issues need to be further incorporated into federal and state policy in order for these programs to reach students who may not otherwise receive the instruction in order to prepare them for higher education. Funding issues for state and federal governments also need to be addressed in order to provide for the demand and maintain the quality of each program. In order to measure outcomes, research needs to couple students taking Advanced Placement (AP) and dual enrollment courses to look at the graduation rates of these students from college to weigh if the programs are truly helping students graduate from college.

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