

**THE ADVANCED PLACEMENT PROGRAM IN PENNSYLVANIA: IMPLICATIONS
FOR POLICY AND PRACTICE IN K – 12 AND HIGHER EDUCATION**

by

Christine Y. Liekar

Bachelor of Science, University of Dayton, 1973

Master of Educational Administration, Point Park University, 2004

Submitted to the Graduate Faculty of
School of Education in partial fulfillment
of the requirements for the degree of
Doctor of Education

University of Pittsburgh

2012

UNIVERSITY OF PITTSBURGH

SCHOOL OF EDUCATION

This dissertation was presented

by

Christine Y. Liekar

It was defended on

March 29, 2012

and approved by

Dr. Charlene Trovato, Ph.D., Associate Professor

Dr. Stewart Sutin, Ph.D., Associate Professor

Dr. Diane Kirk, Ph.D., Associate Professor

Dissertation Advisor: Dr. Mary Margaret Kerr, Ed.D., Department Chair

Copyright ©

Christine Y. Liekar

2012

**THE ADVANCED PLACEMENT PROGRAM IN PENNSYLVANIA: IMPLICATIONS
FOR POLICY AND PRACTICE IN K-12 AND HIGHER EDUCATION**

Christine Y. Liekar, Ed.D.

University of Pittsburgh, 2012

Since the time of Sputnik, American educators and policymakers have recognized the need to raise expectations by increasing rigor in high schools across the United States. Copious studies attest to the fact that students who take Advanced Placement coursework experience success in college (Adelman, 1999; Camara, 2003; College Board, 2005; Dougherty, Chrys, Mellor, Lynn, & Jian, 2006; Geiser & Santelices, 2004; Klopfenstein & Thomas, 2005; Morgan & Ramist, 1998; National Association of National Secondary School Principals, 2004; The National High School Alliance, 2006; The No Child Left Behind Act, 2002; PL107-110, 2001). Performing well on an Advanced Placement exam means more than just accomplishing college-level work; it is a pathway to success in college.

With the acceptance of the Advanced Placement Program as an instrument of rigor by teachers and administrators in secondary education and higher education, alike, the purpose of this research study was to aggregate and examine data available in public documents pertaining to the Advanced Placement Program in Pennsylvania. This study is meant to present a picture of where we, as a state, are now. It is meant to be a prelude, a preface to a more complete story in the years to come.

TABLE OF CONTENTS

PREFACE.....	XI
1.0 INTRODUCTION.....	1
1.1 RAISING OUR SIGHTS: NO HIGH SCHOOL SENIOR LEFT BEHIND	3
1.2 THE NO CHILD LEFT BEHIND ACT OF 2002.....	5
1.3 A CALL TO ACTION: TRANSFORMING HIGH SCHOOL FOR ALL	
YOUTH	5
1.4 CONCLUSION	7
2.0 REVIEW OF RELATED LITERATURE.....	8
2.1 HISTORICAL OVERVIEW	9
2.2 GROWTH OF THE ADVANCED PLACEMENT PROGRAM.....	14
2.3 FACTORS CONTRIBUTING TO THE GROWTH OF THE ADVANCED	
PLACEMENT PROGRAM	17
2.3.1 Problems Associated with the Growth of the Advanced Placement	
Program	22
2.4 RESEARCH.....	26
2.5 STUDIES VALIDATING THE NEED FOR MANDATORY AP EXAMS.	34
2.6 FEDERAL SUPPORT FOR THE ADVANCED PLACEMENT PROGRAM	
36	

2.7 STATE SUPPORT FOR THE ADVANCED PLACEMENT PROGRAM. 43

2.7.1 California..... 46

2.7.2 Texas 47

2.7.3 Florida..... 48

2.7.4 New York..... 49

In 2007, New York City created an incentive program called Rewarding Achievement (REACH) to increase Advanced Placement participation (Rewarding Achievement, n.d.). The program was launched by The Council of Urban Professionals and the Pershing Square Foundation, with the intent of improving college preparedness and college graduation rates of low-income high school students, particularly from underrepresented racial and ethnic groups. Currently, the program is being offered in 31 high schools with large minority demographics..... 49

Much like Florida, the New York program offers financial rewards for both students and schools. Scholar Rewards range from \$500 to \$1000 for each passing score attained (Rewarding Achievement). In 2009, a total of \$825,000 was awarded to New York City students, the highest amount, \$3,250, was awarded to a Flushing High School student from Queens (Medina, 2009). Free Advanced Placement workshops are offered by the program, to aid in student success. Additionally, schools are rewarded for success with financial incentives called Reach Bonus Grants, which can be used to provide professional development for teachers. Increased course offerings, and to strengthen academic programs. Positive results have been noted. The number of Advanced

Placement tests taken at participating high schools has increased in the 2008-2009 school year to 5,436, which is an increase of 800 exams. The number of passing grades on Advanced Placement exams in the same school year, also rose to 1,774, an increase of 300. However, differing from Florida and Texas, the passing rate on Advanced Placement exams rose slightly, from 32 percent to 33 percent..... 50

2.7.5 Indiana..... 50

2.7.6 Advanced Placement Expansion Project: Alabama, Georgia, Kentucky, Maine, Nevada and Wisconsin..... 52

2.7.7 Pennsylvania 55

2.8 CONCLUSION 59

3.0 RESEARCH METHODOLOGY 62

3.1 STATEMENT OF THE PROBLEM..... 64

3.2 RESEARCH QUESTIONS..... 65

3.3 OPERATIONAL DEFINITIONS 65

3.4 DATA COLLECTION PROCEDURES 69

3.5 DATA ANALYSIS..... 73

3.6 LIMITATIONS..... 76

4.0 RESULTS 78

4.1 RESEARCH QUESTION ONE: WHICH PUBLIC HIGH SCHOOLS IN PENNSYLVANIA ARE INVOLVED IN THE AP PROGRAM? ARE THE NUMBER OF AP COURSES OFFERED AND THE NUMBER OF STUDENTS ENROLED DIRECTLY REATED TO THE SCHOOL POPULATION,

GEOGRAPHIC LOCATION OR THE SOCIO-ECONOMIC STATUS OF THE STUDENT POPULATION?.....	80
4.1.1 Pennsylvania Cyber/Charter High Schools.....	81
4.1.2 Pennsylvania Traditional Public High Schools.....	86
4.2 WHAT ACCEPTANCE POLICIES AND REQUIREMENTS ARE IN PLACE IN PENNSYLVANIA INSTITUTIONS OF HIGHER LEARNING REGARDING THE GRANTING OF AP CREDITS?	101
4.2.1 State-Related Universities.....	102
4.2.2 State Owned Colleges and Universities	103
4.2.3 Private Colleges and Universities.....	104
4.2.4 Private Liberal Arts Colleges	106
4.2.5 Two-Year Community Colleges	108
5.0 DISCUSSION AND IMPLICATIONS	110
5.1 IMPLICATIONS FOR FUTURE RESEARCH.....	115
APPENDIX A	117
REFERENCES.....	119

LIST OF TABLES

Table 1. <i>AP Scholar Award Levels</i>	14
Table 2. <i>AP Program Participation in Five Year Increments from 1955 – 2010</i>	16
Table 3. <i>Advanced Placement Examinations by Content Area and Subject</i>	18
Table 4. <i>Four Year Graduation Rate Based on Advanced Placement Work</i>	29
Table 5. <i>Advanced Placement Incentive Programs by State</i>	45
Table 6. <i>Increase in Advanced Placement Enrollment by State</i>	55
Table 7. <i>Operational Definitions</i>	66
Table 8. <i>Data Collection Procedure for Research Question 1</i>	70
Table 9. <i>Data Collection Procedure for Research Question 2</i>	72
Table 10. <i>Pennsylvania Counties</i>	87
Table 11. <i>Pennsylvania Counties with 100% Participation in the AP Program</i>	89
Table 12. <i>Pennsylvania Counties with Lowest Participation Rate in the AP Program</i>	92
Table 13. <i>Pennsylvania Counties with Low SES and Participation Rates Higher than 10% in the AP Program</i>	93
Table 14. <i>Pennsylvania Counties with Highest Participation Rates with Free and Reduced Lunch Percentage Noted</i>	94
Table 15. <i>AP exams accepted by Pennsylvania’s Private Colleges and Universities</i>	104
Table 16. <i>AP exams accepted by Pennsylvania’s Private Liberal Arts Colleges</i>	107

LIST OF FIGURES

Figure 1. <i>Advanced Placement Trends for Latino and African American Students</i>	41
Figure 2. <i>Advanced Placement Trends in Philadelphia County Cyber/Charter High Schools</i>	83
Figure 3. <i>Advanced Placement Trends in Allegheny County Cyber/Charter High Schools</i>	84

PREFACE

I wish to give my thanks to a number of individuals who helped me achieve my goal of completing this dissertation, and thus my doctoral studies, at the University of Pittsburgh. I would like to express my sincere gratitude to my advisor, Dr. Mary Margaret Kerr. Without her focus, gift for clarity, vision and intellectual guidance, I could not have completed this work. I am extremely proud and honored to have been given the gift of her time and mentoring. I would also like to thank my committee. Due to the sound leadership and hard work of the following individuals: Dr. Charlene Trovato, Dr. Stu Sutin and Dr. Diane Kirk, I have been successful.

My dear friend and colleague, Dr. Christina Shorall, was the impetus for my studies in educational administration. Without her confidence in me, and her constant encouragement, I would never have begun on this journey.

Without my family, I would not have had the drive and determination needed for completion. It is with love and deep appreciation that I extend my gratitude to my husband, John. My children, Katie, Jack and Betsy, were a constant source of support and motivation, and for this they will have my eternal gratitude and admiration. The latest additions to our family, my grandchildren, Maggie, John and Jackson, give me constant joy. I have always said that the two things that I value most in life are my education and my family

Finally, but by no means less, I acknowledge the visionary faith of my parents, Elizabeth and William J. Yaeger, Jr., whose early foundation and belief in the importance of education

were my compass. It is my greatest wish, that by attaining my degree, I will continue to provide my children and grandchildren with the educational inspiration and academic direction that my parents gave to me.

1.0 INTRODUCTION

In the agricultural age, postsecondary education was a pipe dream for most Americans. In the Industrial age it was the birthright of only a few. By the Space Age, it became common for many. Today, it's just common sense for all. (National Commission on the High School Senior Year, October 2001, para.1)

Educational policymakers and practitioners across America are recognizing the need to raise expectations for all students by increasing academic rigor, and in doing so, are wrestling with the necessary implications of ensuring that students with a wide range of needs and abilities can rise to this challenge. As noted by the National Commission on the High School Senior Year, in their final report to the nation, *Raising Our Sights: No High School Senior Left behind*, the nation needs to raise the academic bar for every student.

To accomplish this goal, in high schools across America, the issue of access to rigorous course content for all must be addressed. In the state of California, *Daniel v. California*, No. BC214156 (*Daniel v. California*, n.d.) filed on behalf of Latino and African-American high school students in California, brought to light inequities in the quality and extent of educational opportunities. National organizations promote the widening of access to a college preparatory

curriculum, especially the exploration of post-secondary study while still in high school, via Advanced Placement courses, International Baccalaureate and Dual Enrollment programs (National High School Alliance, 2006).

Copious studies have shown that students who take a college-preparatory curriculum, and in particular Advanced Placement coursework, are more successful in college (Adelman, 1999; Camara, 2003; College Board, 2005; Dougherty, Mellor, & Jian, 2006; Geiser & Santelices, 2004; Klopfenstein & Thomas, 2005; Morgan & Ramist, 1998; National Association of Secondary School Principals, 2004; The National High School Alliance, 2006; The No Child Left Behind Act, 2002; PL107-110, 2001). In 2000, United States Secretary of Education Richard W. Riley concurred, “At a time when we need to encourage all students to aim higher, Advanced Placement courses motivate students to master challenging materials and perform at the highest levels.” (Curry, MacDonald & Morgan, 1999, p.17)

Raising expectations is essential for all. No student in America, today, should be automatically excluded from the opportunity to pursue a post-secondary education by a curriculum that does not prepare him, or her, for college-level work (National High School Alliance, 2006). An educational system that rations demanding college-preparatory programs to the few, needs to raise its requirements to make a college-preparatory curriculum the default curriculum for all. To accomplish this endeavor, students, parents and educators, alike, must lift their aspirations and realize the important goal of preparing all for rigorous academic work.

Since Sputnik, doubts surrounding the quality and rigor of American education have been a topic of debate among American educators. These doubts have prompted continuous studies and educational introspection over the last fifty years. A sampling of the studies follows.

1.1 RAISING OUR SIGHTS: NO HIGH SCHOOL SENIOR LEFT BEHIND

In June 2000, the United States Department of Education created the National Commission on the High School Senior Year (National Commission on the High School Senior Year, 2001). The Commission, Chaired by Kentucky's Governor Paul Patton, consists of 30 members. This private-public partnership is made up of the United States Department of Education, the Charles Stewart Mott Foundation, and the Carnegie Corporation. The Commission focused on four main concerns:

1. Do academic expectations differ for college bound students and students going directly to the workforce?
2. Why do so many students need remediation when they arrive at post-secondary institutions and often not complete degrees?
3. Why are so many high school graduates unprepared for the workforce?
4. Can the educational system be restructured to increase student achievement?

The final report of the National Commission on the High School Senior Year, *Raising Our Sights: No High School Senior Left Behind*, calls for a "Triple A Plan" which recommends increased alignment between all educational levels, higher achievement using college-preparatory study, and extended and more rigorous alternatives to the traditional senior year (Cheuvront & Barbour, October 4, 2001). The report goes on to refer to post-secondary education as the new common sense. The commission additionally comments that unless high schools require students to complete a rigorous and demanding course of study, educators will grossly limit their students' opportunities and relegate them to a lifetime of low-level jobs, thus decreasing human capital.

The commission cited a need to raise awareness in the home (National Commission on the High School Senior Year, 2001). Family resources and knowledge of the educational system create the plan and support necessary for completion of rigorous coursework that is the perfect segue between high school and post-secondary education. Low income, disadvantaged and first-generation college students are often forced to rely, solely, on school support, counseling and resources. Without proper warning and stringent guidance, these children and their potential will slip through the cracks of our educational system. The commission further recommends that school districts obtain written, parental permission before assigning high school students to anything below a “college-preparatory” schedule.

The commission found that the nation’s teachers do not always believe that all students need the skills, knowledge and attitudes of the traditionally college bound, and only 38 percent of the teachers surveyed consider helping students prepare for further, post-secondary learning to be very important (National Commission on the High School Senior Year, 2001). More importantly, this “soft bigotry of low expectations” (p. 27), can significantly lower the life chances of many low-income, disadvantaged and first generation college students. By greatly expanding the opportunities for all high school students to experience the challenges of college-level work, specifically through the Advanced Placement program, educators can enable their students to meet and exceed post-secondary admission requirements.

Acknowledging the need for further academic reforms, the federal government passed an educational reform act in 2002.

1.2 THE NO CHILD LEFT BEHIND ACT OF 2002

The No Child Left Behind Act of 2002, also known as the Elementary and Secondary Education Act, is the most recent federal initiative instituted for the purpose of administering help to reform the ailing American educational system. Although education was initially created to be the responsibility of the state, the federal government, today, has assumed a greater role in its regulation. *The No Child Left Behind Act of 2002*, a bill that was written and sponsored by Senator Edward Kennedy and signed by President George W. Bush, places great importance on providing opportunities for all students to achieve and excel (Estacion, McMahon, & Quint, 2004). One of the express purposes of the No Child Left Behind Act is to encourage greater numbers of students to achieve a post-secondary or an advanced degree while reducing the amount of time it takes to achieve both. Section 1702 of PL107-110, entitled “Access to High Standards Act”, proposes guidelines for increasing State and local efforts to raise academic standards through advanced programs, specifically the Advanced Placement Program (PL 107-110, 2002).

1.3 A CALL TO ACTION: TRANSFORMING HIGH SCHOOL FOR ALL YOUTH

The National High School Alliance has a commitment to fostering academic achievement, lessening the achievement gap and promoting civic and personal growth in America’s high school students (The National High School Alliance, 2006). The Alliance’s focal point is the belief that the purpose of high school is to ensure that all students are prepared for college, the work force and active civic participation. In *A Call to Action: Transforming High School for all*

Youth, The National High School Alliance provides a common framework for leaders and stakeholders to plan, implement and assess practices that align school, community state and federal policy based solutions. In their 2006 report, after reviewing recommendations from national policy and research organizations, the National High School Alliance notes that there are six core principles that emerge from their research of strategies necessary to improve the nation's high schools. They are:

1. Personalized learning environments;
2. Academic engagement of all students;
3. Empowered educators;
4. Accountable leaders;
5. Engaged community and youth;
6. Integrated system of high standards, curriculum instruction, assessments, and supports.

(The National High School Alliance, 2006, p.2)

Core Principle Six highlights the need for rigor. The Alliance maintains that encouraging students to take rigorous coursework, like the coursework found in the Advanced Placement program, will not only create an automatic alignment between course content and assessment, but it will give students the opportunity to test themselves and their ability ((The National High School Alliance, 2006). Successful Advanced Placement testing will add the benefit of giving college credit and validation to those high school students who may doubt their scholarly abilities and the possibility of future post-secondary success.

1.4 CONCLUSION

“Our superiority was once the envy of the world,” says *Time*, on its February 2006 cover, noting America’s decline in science achievement. (Klein, 2006). *Time* goes on to criticize the American educational system by stating that, “we are slacking off just as other countries are getting stronger” (p.116).

The consensus of American educational policymakers is that this decline in the American educational system is prevalent across the nation. While there are glimmers of hope in school districts across the nation, there is much cause for concern. Whatever the causes of the decline in the American educational system, many policy makers and educational leaders agree that the long-term consequences may be great. Alec Klein, in his book, *A Class Apart: Prodigies, Pressure, and Passion Inside One of America’s Best High Schools*, quotes the concerns of former chairman and chief executive of IBM, Louis V. Gerstner, Jr., who is currently the chairman of the Teaching Commission, which is an educational group comprised of leaders in government, business, and education, in its spring 2006 report:

Unless we start figuring out far more effective ways to teach basic and high level skills in our public schools, we still pay a serious price in economic competitiveness and social and political upheaval. If we do not go far further, far faster, we will soon be talking in the past tense about America’s greatness.” (pp.117-118).

Young people should not have to wait until they have a high school diploma to learn if they are prepared for college-level coursework (National Commission on the High School Senior Year, 2001). They, and their parents, should never be forced to discover at the end of their high school career that they should have taken college-preparatory courses from the beginning.

2.0 REVIEW OF RELATED LITERATURE

Former U.S. Secretary of Education Margaret Spellings in commenting on the Advanced Placement program stated, “Expanding access to advanced placement programs would provide more disadvantaged high school students the opportunity to take challenging courses so that they will enter college or the global marketplace ready to excel” (Expanding the Advanced Placement Incentive Program, 2006, p.1). This literature review focuses on the history of the Advanced Placement program, its growth and the reasons for that growth, and the problems associated with the evolution of this program.

Since 1955, the Advanced Placement Program has afforded millions of students with the opportunity to take college-level coursework and exams, enabling them to earn college credit while still attending high school. More than 90 percent of the country’s four-year colleges and universities, as well as institutions of higher learning in more than 45 countries, internationally, have an Advanced Placement policy that gives entering students college credit, placement, or both based on qualifying Advanced Placement exam grades (CollegeBoard, 2010). Advanced Placement exams are one of the few standardized tests that American high school teachers respect as valid assessments of students’ abilities. For the above stated reasons, many states have taken Margaret Spellings’ words seriously and have created programs to increase student participation in Advanced Placement coursework (Bush, 2009; Gewertz, 2006; Jackson, 2007; Medina, 2009; McElvey, 2009; National Governors Association Center for Best Practices, n.d.).

These financial programs have helped students from a wide variety of backgrounds gain access to, and be successful in, college-level Advanced Placement courses (Dougherty, Mellor, & Jian, 2005). In Pennsylvania, by using state grant monies, specifically from Project 720, to pay for students to take Advanced Placement exams, the state strives to effectively challenge all students to accept academic rigor and reduce the inequities that students from lower socio-economic backgrounds often experience along the way in their educational journey. The following section presents the history behind the Advanced Placement program.

2.1 HISTORICAL OVERVIEW

The Advanced Placement program is a cooperative effort between secondary schools and colleges and universities. The program is based on the premise that well-prepared high school students can be taught to master college-level material. This academically rigorous program began over a half-century ago, in 1955. As private high schools saw their graduates' enrollment in Ivy League universities decrease, elite institutions sought a remedy. A consortium of private schools began to conceptualize courses that would offer smart and ambitious high school students a head start on college (Powell, 1993). After expanding and changing its original name to the Central Committee of the School and College Study, the consortium explored ways to increase the pedagogical value of the last two years of secondary school and the first two years of college. In its final report, published in 1952, *General Education in School and College: A committee report by members of the faculties of Andover, Exeter, Lawrenceville, Harvard, Princeton, and Yale*, the committee cited an educational disconnect and central weakness in the United States educational system. The committee found a failure between high school and

colleges to recognize their jobs as part of a continuous process. This disconnect was causing academically able students to repeat much of what they had learned in high school when they entered universities, causing “a serious loss of academic momentum” (Rothschild, 1995, p.26; *Central Committee of the School and College Study*, 1952). The most influential of the committee’s recommendations was that secondary school students be offered college-level courses at their high schools during their senior year.

In 1951, the Ford Foundation’s fund for the Advancement of Education sponsored two parallel studies (College Board AP Central, n.d.). Both studies concluded that secondary schools and colleges should work together to ensure that there would be no repetition of course work at the high school and college level. The Foundation’s recommendation was to create a set of achievement examinations to give hard working, intelligent high school students advanced placement. This idea, which began in 1951 at Kenyon College with a discussion by faculty members concerning the possibility of allowing strong secondary students to begin working on a college degree, would eventually lead to the beginnings of the Advanced Placement program, as we know it today (*Central Committee of the School and College Study*, 1952). Kenyon College began by conducting a project that called on faculty the responsibility to create freshman-level courses that could be the foundation for advanced placement courses. The Kenyon Plan, with funding from the Ford Foundation, expanded the concept to 12 colleges and secondary schools (CollegeBoard, 2001). Eleven subjects were originally chosen. These subjects included, but were not limited to, English composition and literature, biology, chemistry, physics, French, Latin, German and Spanish. In doing this, the Ford Foundation started the program that would eventually grow into the Advanced Placement program as we know it today.

With the help of the Educational Testing Service (ETS), examinations were begun, in the 1953-1954 school year (Callahan, 2003). The first exams were given in May of 1954. As a means of assessing validation, the exams were given to high school seniors and to college freshmen at 12 participating colleges. A comparability study was performed by the ETS by comparing the high school candidates' scores with those of the college students. The College Board, after being asked by the participating institutions, assumed control of the Advanced Placement program. Williams College history professor Charles P. Keller became the first director and administered the College Board's Advanced Placement's first examinations in May of 1956.

Keller was instrumental in convincing colleges of the newly created program's strengths (Callahan, 2003). By 1961, James B. Conant, Harvard's president, had become an advocate of the Advanced Placement program. Conant argued that the Advanced Placement program was the mark of real improvement in the United States educational system.

The College Board began its commitment to teacher training during the 1960's by offering workshops to Advanced Placement faculty consultants and Summer Institutes for teachers (CollegeBoard AP Central, n.d.). Many teachers saw teaching Advanced Placement classes as an interesting new opportunity.

By the 1990's, the College Board began expanding the goals of the Advanced Placement program by offering Pre-AP programs (CollegeBoard AP Central, n.d.). AP Vertical Teams and Building Success workshops for teachers to aid students in gaining the necessary skills to be successful in advanced studies, even before high school, were also begun in the 1990's. Vertical Teams allow teachers from different grade levels to develop and implement sequential curriculums in specific disciplines.

As academic disciplines have evolved, so have Advanced Placement course offerings. The AP Computer Science course was introduced in 1984; AP Environmental Science began in 1998 (CollegeBoard AP Central, n.d.). The Advanced Placement Programs now offers 34 courses.

As the program grew, the College Board detected the underrepresentation of minorities and less-privileged students and began outreach efforts to include schools and students within low-income communities (CollegeBoard AP Central, n.d.). In 1965, workshops were held by The College Board at the Hampton Institute in Virginia to foster the development of Advanced Placement courses in that area. By 2002, minority participation in the Advanced Placement program rose to 31 percent.

The Advanced Placement program enables students to receive a taste of college while still in a high school environment. The tests continue to be administered every May in high schools around the nation. Each exam is a three hour timed test consisting of multiple choice questions and free-response questions (Ridenhour & Siebert, 1997).

The Advanced Placement Exams are scored on a five-point scale:

5 = extremely well qualified

4 = well qualified

3 = qualified

2 = possibly qualified

1 = no recommendation

The American Council of Education has accredited the Advanced Placement program and recommends that colleges and universities award credit for exam scores of 3 or above (AP

International Recognition, n.d.). Admission policies vary from school to school; however, credit for a passing grade of 3 is the standard recognized by most colleges and universities in America, as well as colleges and universities in 32 countries worldwide. Nearly one-third of American colleges and universities use Advanced Placement scores as a factor in the determination of scholarship recipients. The College Board reports that, based on comparability studies, an Advanced Placement score of 5 is akin to earning an A in the comparable college course. The scores of 4, 3, and 2 equate to grades of B, C, and D respectively in the same college course. Individual colleges decide whether to allow students with passing scores to bypass introductory courses completely.

The College Board recognizes student performance in its AP Scholar Awards program (CollegeBoard Inspiring Minds, n.d.). Advanced Placement Scholar Awards recognize high school students who have exhibited college-level achievement on Advanced Placement exams. No monetary awards are given; however, students receive an award certificate, and the achievement is noted on all Advanced Placement score reports that are sent to participating colleges and universities. Figure 1 lists award levels and their descriptors.

Table 1. *AP Scholar Award Levels*

TYPE OF AWARD	DESCRIPTION
AP Scholar	Awarded to students with a score of 3 or higher
AP Scholar with Honor	Awarded to students with an average score of 3.25 on all exams taken
AP Scholar with Distinction	Awarded to students with an average score of 3.5 on all exams taken, and score of 3 or higher on five or more exams
State AP Scholar	Awarded to one male and one female student in each state and the District of Columbia with scores of 3 or higher on the greatest number of AP exams, and also the highest score (no less than 3.5) on all exams
National AP Scholar	Awarded to students who have an average score of 4 on all AP exams, and scores of 4 or more on eight or more exams
DoDEA AP Scholar	Awarded to one male and one female student attending Department of Defense Education Activity School with the highest average score on the greatest number of exams (minimum requirement of 3 or higher on three exams

Note. Adapted from “A P Scholar Awards,” College Board Inspiring Minds, n.d. .

2.2 GROWTH OF THE ADVANCED PLACEMENT PROGRAM

It is a common perception that the Advanced Placement program opens the doors to higher education for diverse populations of students in contemporary classrooms (Casserly, 1986;

Dodd, Fitzpatrick, DeAyala & Jennings, 2002; Geiser & Santelices, 2004; Koch, Fitzpatrick, Triscari, Mahoney & Cope 1988; Morgan & Maneckshana, 2000; Morgan & Ramist, 1998; Willingham & Morris, 1986). In the first year of its inception (1955 – 1956) 1,229 seniors from 104 participating high schools took 2,199 exams (Bernhole, Baenen & Howell, 2000; Callahan, 2003). At that time, only 130 colleges and universities in the United States, accepted Advanced Placement credit. Although initially intended for a select group of 5% of high school seniors, Advanced Placement coursework has become available to a much larger representation of students (Rothschild, 1995). Courses are now offered to freshmen, sophomores, juniors and seniors at much higher percentage rates. Recently, strong governmental leadership has broadened access to the Advanced Placement program. Currently, over sixty percent of the high schools in America participate in the Advanced Placement Program (Lewin, February 8, 2006). In 2006, 1.34 million U.S. students (nearly 23 percent) took 2.3 million Advanced Placement exams; this number reflects an increase of approximately 105,066% (College Board, 2006b). In 2007, 1,464,254 students representing 16,464 secondary schools took Advanced Placement exams (College Board, 2008). As shown in Table 2, in 2009-2010, the most recent data available indicates that 17,861 high schools in the United States were represented by an astounding 1.8 million students. More than 3,000 students took seven or more Advanced Placement exams last year. New York, Maryland, Virginia, Florida, Massachusetts and Connecticut all had more than 20 percent of their students achieve a grade of 3 or above. Utah and California are close to achieving the 20 percent benchmark.

Table 2. *AP Program Participation in Five Year Increments from 1955 – 2010*

YEAR	SCHOOLS	STUDENTS	EXAMINATIONS	COLLEGES
1955-56	104	1,229	2,199	130
1960-61	1,126	13,283	17,603	617
1965-66	2,518	38,178	50,104	1,076
1970-71	3,342	57,850	74,409	1,382
1975-76	3,937	75,651	98,898	1,580
1980-81	5,253	133,702	178,159	1,955
1985-86	7,201	231,378	319,224	2,125
1990-91	9,786	359,120	535,186	2,587
1995-96	11,712	537,428	843,423	2,895
2000-01	13,680	844,741	1,414,387	3,199
2005-06	16,000	1,339,282	2,312,611	3,638
2009-10	17,861	1,845,006	3,213,225	3,855

Note. Adapted from “The 6th Annual A P Report to the Nation,” College Board, 2010.

For Pennsylvania public schools, successful Advanced Placement participation is on the rise. In 2004, 42, 846 Advanced Placement exams were taken, and in 2005, 46,222 exams were taken, reflecting a 7.9 percent increase (CollegeBoard, 2006). In 2004, 28,757 students achieved a score of 3 or above. In 2005, 31,121 students reached that benchmark; this reflects an 8.2 percent increase in one year. Pennsylvania saw an increase in the number of exams taken by graduating seniors in 2004, 2007, 2008 and 2009 (CollegeBoard, 2010). 24, 606 students from

the graduating class of 2009 took at least one Advanced Placement Exam while in high school as opposed to 23, 788 students in the class of 2008. 21,894 students in the class of 2007 took the exam compared to 18,168 in the class of 2004.

National data reflect a similar increase in participation and passage rates. From 1992 to 1998, the number of Advanced Placement exams taken grew by 357,715, reflecting an increase of 79 percent. The number of Advanced Placement exams receiving a grade of 3 or above during the same time period grew by 216,955; this is an increase of 75 percent.

Regionally, Allegheny County, in the year 2004, had an overall Advanced Placement participation rate of 16 percent with 52 percent of the exams scored 3 or above (Standard and Poor's, 2004.). Washington County scored lowest regionally with a 9.1 percent rate of participation and only 31.9 percent of the exams achieving a score of 3 or above.

2.3 FACTORS CONTRIBUTING TO THE GROWTH OF THE ADVANCED PLACEMENT PROGRAM

The current status of 34 college-level courses nearly triples the number of original offerings (CollegeBoard, 2000a). Table 3 lists the current approved courses and exam offerings.

Table 3. *Advanced Placement Examinations by Content Area and Subject*

Content Area	Subjects	Examinations
Language	English French Spanish German Latin Chinese Italian	Language and Composition Literature and Composition International English Language Literature Language Literature Virgil Language and Culture Language and Culture
Science	Biology Chemistry Environmental Science Physics Computer Science	Biology Chemistry Environmental Science Physics B Physics C–Electricity and Magnetism Physics C – Mechanics Computer Science A Computer Science AB
Social Studies	Economics Government and Politics History Geography Psychology Calculus Statistics Art Music	Macroeconomics Microeconomics Comparative United States European World United States Human Geography Psychology Calculus AB Calculus BC Statistics Art History Studio Art – Drawing Portfolio Studio Art – General Portfolio Music Theory

The rapid growth of the Advanced Placement program can be attributed to a number of factors (Rothschild, 1995). First, the Advanced Placement program offers readily available curricula. Second, the curriculum is supported by professional development opportunities for teacher implementation. Third, Advanced Placement programs have seen an increase in endorsements by federal and state educational policy. With 75 percent of high school graduates in the United States going to college, the nation is democratizing access to post-secondary education. Unfortunately, high college dropout rates and the need for freshmen remedial coursework demonstrate the need for secondary schools to do more than simply help their students gain college admission. In order to insure what really counts - successful degree - completion, the disparity between high school graduation requirements and freshmen college course requirements must be ended. Success on an Advanced Placement exam is defined as a grade of 3 or higher, which represents a score that is predictive of success in college and college graduation. Recommendations for the rigorous Advanced Placement coursework for successful secondary learners are found in numerous articles appearing regularly in the journal of the National Association of Secondary School Principals (National Association of Secondary School Principals, 2004).

Other factors have contributed to the successful growth of the Advanced Placement program since its inception (CollegeBoard, 2008). An increasingly large number of schools participate in the program annually. Once a school chooses to participate, it typically adds Advanced Placement courses and examinations, creating a unique portfolio of Advanced Placement offerings. The number of students taking existing courses and the corresponding examinations increase annually. Finally, an increasing number of post-secondary institutions are

willing to grant credit for satisfactory (a grade of 3 or higher) performance on the Advanced Placement examinations.

Frequently cited as a major attraction for enrolling in Advanced Placement coursework is the ability to complete a bachelor's degree in a shorter time period, thus reducing the cost of achieving an undergraduate degree. Many students are able to enter college as sophomores, completely bypassing their freshman year. In a personal communication with a local assistant superintendent, the statement was made that, "Despite what you think of the Advanced Placement Program, it is effective. Last year, one of our graduates entered The University of Notre Dame with 30 credits." (Dr. Bille Pearce Rondinelli, EdD., personal communication, September 28, 2008). The money saved by eliminating a freshman year of study often allows students to use the savings to pay for graduate studies. Currently, however, there is a movement among some of America's most competitive universities to amend their Advanced Placement credit policies to disallow freshmen exemptions from certain introductory courses (Lichten, 2007).

Another benefit of taking college-level coursework in high school is the conviction that students will develop study skills, time-management skills and experience that will foster college success. In the high school milieu, it is often possible for teachers, principals and guidance counselors to encourage students who would not normally consider themselves to be capable of performing successfully in college level coursework. This is particularly true of students who might become the first members of their families to enroll in college, students from economically disadvantaged backgrounds and students whose peers do not value post-secondary education. In an effort to increase the success of the Advanced Placement program and begin training students at a younger age, the College Board implemented a Pre-AP program.

The Pre-AP program began in 2000 under the premise that all students can perform at rigorous academic levels (CollegeBoard, 2000c). The Pre-AP program consists of two parts:

1. Spring Board, which offers a rigorous core curriculum for students in grades 6 – 12 in mathematics and English
2. Pre-AP Professional Development provides instruction for teachers through Building Success workshops and AP Vertical Teams workshops, conferences and summer institutes.

Vertical Teaming is a method used by school districts to ensure a coherent and seamless flow of instruction across grade levels (CollegeBoard, 2000c). The heart of Vertical Teaming, which works as a feeder system centers on curricular planning among content-area teachers. Building Success focuses on specific learning strategies, unlike Vertical Teaming, which concentrates on curriculum planning and content. The Vertical Teams introductory material is created for instructors in all of the Advanced Placement content areas except mathematics. Each section of the introductory materials contains a model for the vertical curriculum, suggested teaching topics and a rationale. The Pre-AP program increases teacher communication and aligns curriculum in the districts that have implemented it. Pre-AP programs focus on academic skills and students' strengths. A key feature of the program is to enhance support in individual schools for underrepresented students who want to pursue Advanced Placement coursework. With the addition of Pre-AP, Vertical Teaming and Building Success Workshops, the Advanced Placement program continues to grow annually. Although the Advanced Placement program has grown in size and support in the half-century of its existence, problems are associated with this growth.

2.3.1 Problems Associated with the Growth of the Advanced Placement Program

Concerned about quality and the rapid growth of the Advanced Placement program, the College Board announced in 2007 that all high school Advanced Placement teacher would have to prove that they were, in fact, teaching college-level coursework (DeVise, 2008). The first quality controlled audit of the Advanced Placement Program addressed the mounting concern that, because of the swift expansion of the college-preparatory program, there had been a decrease in the rigor of the coursework. At the request of secondary school and college and university members of the College Board, the AP Course Audit was created. The purpose of the audit was twofold; the audit would:

- Provide a set of clear guidelines for teachers and administrators on the curricular and resource requirements for Advanced Placement courses
- Assist colleges and universities in interpreting secondary school courses designated "AP" on students' transcripts

To receive authorization from the College Board to label a 2008-2009 course "AP," schools must demonstrate how their courses met or exceeded audit requirements.

The results of the first year-long audit showed that of the 146,671 Advanced Placement courses that were submitted for review, 136,853 were approved, showing a 93 percent passage rate (Cech, 2007). Trevor Packer, College Board vice president for the Advanced Placement Program, in speaking of the first audit professed the belief that the 93 percent passage rate illustrated that Advanced Placement teachers are teaching effective courses. Robert Tai (2008) criticized the first Advanced Placement audit with harsh words. Tai claimed that the audit was nothing more than a cursory review of a list of topics included in an Advanced Placement course,

having no documented connection to authentic instruction. One of the more surprising results of the audit was a steep drop in the number of high schools offering Advanced Placement coursework. Despite 30 years of steady growth, the number of schools offering at least one Advanced Placement course fell nearly 13 percent from 2006-2007 school year to the 2007-2008 school year.

Some top universities have become more stringent in the acceptance of Advanced Placement courses for college credit. In 2007, Massachusetts Institute of Technology, stopped issuing credit for the Advanced Placement biology course and created its own placement exam (Drew, 2011). University Dean of Admissions Stuart Schmill found that some students who had scored a 5 on the Advanced Placement exam did not have the problem solving abilities necessary for higher-level biology courses. Also, the University of Texas has changed its placement rules for biology and gives credit only to students who have received a score of 5, although many universities still accept scores of 3 or 4.

The Advanced Placement program works to maintain the integrity of its standards in other ways. Advanced Placement courses and examinations are revised regularly by the Advanced Placement Development Committee to ensure that they correlate with the skills typically covered by corresponding college courses (Curry et al, 1999). Committees use data from national curriculum surveys of college courses. College comparability studies are conducted periodically to check grading standards (DiYanni, n.d.). A part of the Advanced Placement exam is administered to college students upon completion of the course that corresponds to the Advanced Placement course. The performance of the college students who were given the Advanced Placement exam is compared to their course grades validating the relationship between Advanced Placement exam scores (5-1) and college letter grades.

Educators who are critics of the Advanced Placement program are rethinking their courses. Frequently what is learned in Advanced Placement courses is fixed content; students use memorization not critical thinking skills. Critics also feel that breadth of knowledge is stressed, and because of the abbreviated time constraints of a high school class, depth of learning is often slighted. Whereas college professors can choose what they cover in their introductory courses, the Advanced Placement test can touch on almost anything, forcing high school students to absorb more material than college freshman. The National Academy of Sciences drew attention to this problem in 2002 (Drew, 2011). A committee of the National Research Council criticized Advanced Placement science classes for forcing students to absorb too much material rather than letting students design their own lab experiments. The volume of material to be memorized did not allow students to problem solve, experience controversies and scholarly investigation.

In an article appearing in *The New York Times Education Life*, entitled “Rethinking Advanced Placement,” Christopher Drew (2011) outlined the changes that would be instituted in February 2011 by the College Board. A comprehensive revamping of the Advanced Placement biology and United States history courses will take place. Trevor Packer, the vice president of Advanced Placement for the College Board, noted that the changes represent a new direction for the board, which traditionally has focused on testing, not coursework. The changes to curriculum focus on what students will need to do with their knowledge. The changes will start in 2011 with a new curriculum for German and French language. Larger revisions to chemistry, physics, world history, European history and art history are to follow. If all goes as planned, the College Board expects the exams to be ready in 2014 or 2015.

Biology will be divided into four big ideas (Drew, 2011). The first is that evolution drives the polarity of life. The other big ideas “emphasize the systematic nature of all living things: that living things use energy and molecular building blocks to grow; respond to information essential to life processes; and interact in complex ways” (p.4). Nearly 20 chapters of the 56 - chapter Advanced Placement biology book will not be tested.

The United States history course will be divided into nine time periods with seven all-encompassing themes (Drew, 2011). Instead of requiring students to memorize dates, the course will focus on teaching students how to create historical arguments.

As the Federal government applies pressure to school districts to increase the availability of Advanced Placement courses in secondary schools, Advanced Placement exam results have become a way to measure a school’s worth. Jay Matthews, a *Washington Post* columnist, created the Challenge Index, a method for the statistical ranking of America’s best high schools. The index is a ratio. Mr. Matthews totals the number of a school’s Advanced Placement and International Baccalaureate exams given and then divides by the school’s total number of graduates. *Newsweek* magazine (owned by the Washington Post) publishes the top 100 high schools, as predicted by the Challenge Index, annually. Rotherham and Mead (2006), along with others, have criticized the harshness and erroneous nature of Mr. Matthew’s rankings. In *Challenged Index: Why Newsweek's List of America's 100 Best High Schools Doesn't Make the Grade*, Rotherham and Mead (2006) found that many of the schools listed on *Newsweek's* list of America's Top 100 high schools have large achievement gaps, grossly shortchange disadvantaged groups, and have a substantial number of drop-outs. Jay Matthews, of course, is not in agreement (the Challenge Index is in no way endorsed by the College Board). In response to critics, Mr. Matthews has created another ranking list entitled “Catching-up Schools”. Like

the Challenge Index, this list is also predicated on the number of Advanced Placement tests taken and the number of graduating seniors in each high school. With the rapid expansion of the AP program, along with the belief that AP coursework is valuable for most students, many high school students are taking AP courses, but fewer students are passing. The Catching-up Schools list adds one more qualifying factor: schools making the list have an AP exam pass rate of less than 10 percent.

With the concern of educators focusing on the need for high school reform, the Advanced Placement program has come under much scrutiny. Many studies have been conducted over the last twenty years, assessing the value of rigor and advanced studies for high school students.

2.4 RESEARCH

The U.S. Department of Education's landmark study, *Answers in the Tool Box* (Adelman, 1999), was a study of the factors that contribute to long-term bachelor's degree attainment. The research for this extensive study was extracted from the high school and college transcripts, test scores, and surveys of a national cohort of students from the time they were in 10th grade in 1980 until approximately age 30 in 1993. Adelman's studies used data from the High School and Beyond (HS&B) and National Education Longitudinal Study (NELS). The results of the study revealed that a rigorous high school curriculum, as required in Advanced Placement courses, is a powerful predictor of success in college. A "rigorous curriculum" is usually defined as one that provides students with a firm background in math and science and teaches reading comprehension and clarity in written work (Adelman, 1999; Klopfenstein & Thomas, 2005; Rose & Betts, 2001). Although Advanced Placement courses are one indication of academic rigor,

there are many others. Also to be considered are the years of science studied, highest level of math successfully completed, and participation in honors courses are also indicative of college success (Klopfenstein & Thomas, 2005).

Adelman (1999) found that high school curriculum reflects 41 percent of the academic resources (i.e., a composite measure of the academic content and performance the student brings from secondary school into higher education) students bring to higher education; test scores, 30 percent; and class rank/GPA, 29 percent. The relationship of curriculum with bachelor's degree attainment is also higher (.54) than test scores (.48) or class rank/GPA (.44). Adelman considers the curriculum-intensive Advanced Placement Exams to be the epitome of achievement tests and also believes that their validity in predicting college performance should be an expected conclusion by educators.

Of all pre-college curricula, the highest level of mathematics a student pursues during high school has the strongest influence on bachelor's degree completion (Adelman, 1999). Finishing a course beyond the level of Algebra 2 more than doubles the chances that a student will complete the bachelor's degree program. Le Tendre (1996) found that when students are subjected to what they perceived to be more challenging mathematical materials, they found value in their studies and were more likely to succeed.

Adelman further notes that the Academic Resources Index produces a much steeper curve toward bachelor's degree completion than socio-economic status. Students in the lowest two SES quintiles, who are also in the top Academic Resources quintile, earn bachelor's degrees at a higher rate than a majority of students from the highest SES quintile. The impact of a high quality and rigorous high school curriculum on degree completion is much greater for African-

American and Latino students than any other pre-college indicator of Academic Resources. The impact for African-American and Latino students is much greater than it is for white students.

Further research to support the validity of the relationship between Advanced Placement course taking and bachelor's degree completion can be found in a study done by the National Center for Educational Accountability (Matthews, 2004). The study is based on data from Texas schools. The study revealed that even students who scored lower than 3 on the Advanced Placement examinations were twice as likely to graduate from college in five years as students who had not taken an Advanced Placement course.

Hargrove, Godin and Dodd (2008) studied five groups of students. They studied students who:

1. took the Advanced Placement course and exam,
2. took the Advanced Placement course only,
3. took the Advanced Placement exam only,
4. were Dual Enrollment students,
5. were in other course groups.

The students were matched by ability, based on SAT scores, and SES (judged by free and reduced lunch status). Hargrove, Godin and Dodd (2008) found that students in Group 1, Advanced Placement course and exam students who scored a 2 or above on Advanced Placement Exams were significantly more likely to graduate from college in four years than the students in the other four groups. Table 4 illustrates the four year graduation rate for Free and Reduced Public Lunch students and for Non-Free and Reduced Public Lunch students from the years 1998 – 2001 in the cohort.

Table 4. *Four Year Graduation Rate Based on Advanced Placement Work*

High School Graduation Cohort Year	Group	Graduation Rate	Free and Reduced Public Lunch Status	Graduation Rate
1998	AP Course and Exam 8,178	37.38% 3,057	FRPL 5,423	12.63%
	AP Course Only 8,772	22.73% 1,994	Non-FRPL 33,484	23.34%
	AP Exam Only 1,922	33.14% 637		
	Other Courses 20,035	14.04% 2,812		
1999	AP Course and Exam 10,712	37.14% 3,978	5,603	12.31%
	AP Course Only 11,945	21.65% 2,586	34,309	23.79%
	AP Exam Only 550	28.00% 154		
	Other Courses 16,705	12.78% 2,135		
2000	AP Course and Exam 13,129	38.00% 4,989	5,581	12.78%
	AP Course Only 11,828	22.67% 2,681	34,537	25.50%
	Other Courses 15,161	12.20% 1,849		
2001	AP Course and Exam 14,888	36.96% 5,503	6,107	13.17% 804
	AP Course Only 10,530	22.94% 2,416	36,092	25.72% 9,284
	Ap Exam Only 388	25.00% 97		
	Other Courses 14,911	11.48% 1,712		

Note. Adapted from “College Outcomes Comparisons by AP and non-AP High School Experiences,” by L. Hargrove, D. Godin, and B. Dodd, 2008.

In an effort to raise the bar in high schools, the National Commission on the High School Senior Year (2001) was created in 2000 to make recommendations on ways to increase rigor in the final years of high school. In *Raising Our Sights: No High School Senior Left Behind*, the

study proposed a three pronged need for a focus on alignment, achievement, and a more rigorous education providing students with increased educational alternatives. The commission noted that:

It is time to move beyond separate systems, in which curriculum and assessment systems in K-12 and postsecondary education bear little relationship to each other, to a more seamless system in which standards, curriculum, and assessment efforts between the two systems are aligned and integrated. (p.20)

The study highly recommended that high schools expand their college level coursework offerings, such as Advanced Placement, as a way to increase educational alternatives.

Also concurring, the American Diploma Project Network focuses on the “big picture;” to be successful in today’s economy, all students will need education and training that go beyond the high school diploma (American Diploma Project Network, 2004). The ADP believes in research that has shown that a powerful predictor of whether high school students will graduate and earn a college degree is the rigor of the high school curriculum they complete. Advanced Placement exams are an excellent indicator of how many students are taking challenging courses and attempting to earn college credit while still enrolled in high school.

Similarly, Dougherty et al (2005) found in a Texas study that the percentage of a school’s students who take and pass Advanced Placement exams is the best indicator of whether a school is preparing its students for success in college. After studying data from the a cohort of 67,412 1994 Texas eighth graders who graduated from high school in 1998 and enrolled in a Texas public college or university within twelve months after high school graduation, the authors concluded that the importance of Advanced Placement exam results indicates the need for school districts to focus on the quality of teaching in Advanced Placement courses and to focus, as well,

on students' preparation before enrolling in Advanced Placement courses. Even low-income and minority students who took and failed an AP exam in high school still had higher graduation rates than students who did not take the AP exam. The results indicate that schools were correct in urging students to try Advanced Placement courses even if they might get a low grade on an Advanced Placement exam. An alternate explanation for the students who took and failed an Advanced Placement test and had higher college graduation rates might have to do with the type of students they were—more tenacious, more motivated, more likely to persevere through tough times.

Jackson (2007) conducted a study of the Texas Advanced Placement Incentive Program. The study found that the program is associated with increases in the number of high school graduates who score over 1100 on the SAT and 24 on the ACT by approximately 30 percent and the number of students who graduate from college by eight percent after two years of adopting the program. These improvements on standardized tests can be attributed most likely to increased exposure to rigorous course material.

Jackson (2007) found the preponderance of evidence from the Texas study noting changes in peer norms, teacher norms, and increased emphasis on Advanced Placement courses and informative material on the benefits of taking Advanced Placement courses. The study's findings suggested some of the reasons that we find less than ideal educational choices in low-income, low-performing schools. The Advanced Placement response was much greater among black and Hispanic students; this suggests that their initial low participation rates were because of cultural differences from the traditional Advanced Placement student demographic. Peer norms did not promote taking Advanced Placement courses. African-American and Hispanic students were also found to be less knowledgeable of how to navigate the college application

process. Minority students' fear of success in Advanced Placement coursework was thought to have been attributed to sub-optimal teacher encouragement.

Overall, students in the United States lag behind students in other countries in the areas of math and science on international tests. The Trends in International Math and Science Study (TIMSS), which was developed by the International Association for the Evaluation of Educational Achievement (IEA) and published every four years, reported that American students scored the lowest of 16 countries in physics and second lowest in Calculus (Lewin, 2006). Gonzalez, O'Connor and Miles (2001) report the results of a second administration of the TIMSS Advanced Mathematics test and TIMSS Physics. The Advanced Mathematics test was administered to 3,819 students enrolled in Advanced Placement. Calculus AB or Advanced Placement Calculus BC. The Physics test was given to 1,869 students taking Advanced Placement Physics B or Advanced Placement Physics C. Advanced Placement students had far better results. All students who had taken AP calculus, even those with a score of 1 or 2, did as well on the TIMSS exams as students from France, the first place country. Students who had taken Advanced Placement Physics, even those receiving low scores of 1 or 2, were outscored only by the top two countries, Norway and Sweden.

In direct contradiction to the studies done by Adleman (1999) and Dougherty et al. (2005) is a survey conducted by Sadler and Tai (Bradt, 2006) who began by surveying high school and college professors' views on the basis of college science success. They then surveyed 18,000 college students at 63 random colleges and universities to correlate those educational factors with student performance and their persistence in college courses. Sadler and Tai found that students, whose high school coursework was centered on in-depth, conceptual learning versus less memorization and a rush to the end of the textbook, fared better in college. Many

scholars who are detractors of the Advanced Placement Program believe that this is a weakness often found in Advanced Placement coursework.

Many of the educators surveyed by Sadler and Tai (Bradt, 2006) believed in the value of the Advanced Placement program. But the students in this study who had taken Advanced Placement science courses, and scored a 5 on the Advanced Placement exam, took the college level introductory course and averaged a college grade of 90. Students with a score of 4 averaged 87 in the same freshman science courses, and students who scored 3 averaged 84. Students who had taken a high school honors class averaged 82. Sadler stated, “In general, it appears that the educational benefits of an Advanced Placement science course as opposed to a regular high school honors course are smaller than the students and teachers are led to believe” (Bradt, 2006, p.2).

The College Board’s data differ. Students who do well on Advanced Placement exams do well in introductory level courses; those who test out of introductory level courses do well in advanced classes (Casserly, 1986; Morgan & Crone, 1993; Morgan & Ramist, 1998).

A study by Kristin Klopfenstein and M. Kathleen Thomas (2005) was less favorable to the Advanced Placement program. After sampling 18,000 Texas students, the authors found that the Advanced Placement experience had no impact on first semester college success for AP students who had taken and passed at least one Advanced Placement exam.

2.5 STUDIES VALIDATING THE NEED FOR MANDATORY AP EXAMS

Geiser and Santelices (2004) studied 81,445 students enrolled in eight University of California campuses and found that merely taking college-level courses offered in high school, such as Advanced Placement and International Baccalaureate, does not appear to improve academic performance in college unless students take the test at the end of the course. They posit that after “controlling for other academic and socio-economic factors, the number of Advanced Placement courses taken in high school bears little or no relationship to students’ later performance in college” (Geiser & Santelices, p.18). The report further stated that students’ scores on the Advanced Placement exam have a greater predictive weight than high school GPA on academic performance in college. “Advanced Placement exam scores are strongly related to college performance” (p.18).

The University of California study was created to analyze the California admissions practice of giving a full extra grade point to any grade received in an Advanced Placement course, even if students did not take the Advanced Placement exam. Advanced Placement administrators in the Washington D.C. area school districts point to the study as confirmation of their belief that the Advanced Placement exams must be mandatory (Matthews, 2004). Bernadette Glaze, a specialist for advanced academic programs in Fairfax County schools, believes that the Geiser and Santelices (2004) study reinforces the district policy, which was instituted in 1998, of mandatory Advanced Placement exams. Superintendents and school boards in Fairfax County have created an extensive Advanced Placement system that is the largest in the country.

Studies following students into college found students who took one or more Advanced Placement exams were more likely than those who did not take any Advanced Placement exams to maintain a B average, graduate with honors and take more coursework in the subject area of their Advanced Placement exam (Morgan & Maneckshana, 2000; Willingham & Morris, 1986).

Another study concentrating on student transcript data from several universities found that Advanced Placement students scoring 3 or better on Advanced Placement exams while in high school received higher grades than non-AP students in college STEM courses, such as biology, English, history, and calculus (Morgan & Klaric, 2007). Underrepresented African-American and Hispanic students majoring in STEM disciplines numbered substantially higher across all groups and concentrations for students taking Advanced Placement courses in high schools compared to those who did not. Students taking one or more Advanced Placement exams graduated earlier than non-AP students. This finding applied to all racial, ethnic and gender groups studied.

Believing in the value of mandatory Advanced Placement testing, Arkansas, Florida, South Carolina and Minnesota will follow Fairfax County's lead by paying for all of their students' Advanced Placement exams beginning in Spring, 2006 (Lewin, 2006). In Arkansas, which began paying for Advanced Placement exams in the spring of 2005, the number of students involved in the Advanced Placement program doubled in one year, as did the number of low income students involved in the program? The number of African-American students tripled.

Students living in wealthy school districts often have access to numerous Advanced Placement courses, while other students do not (*Daniel v. California*, 1999). Although *Daniel v. California* was filed on July 27, 1999, this is a pervasive problem that continues to this day.

Locally, as recently as October, 2010, the McKeesport Area School District was sued by two child advocacy groups, Education Law Center of Philadelphia and Kids Voice of Pittsburgh (Neiderberger, 2010). The suit alleges that the McKeesport Area School District has excluded and segregated students from the Auberle Group Home by placing them in classes separate from the school's general population. By this practice, Auberle students have no access to Advanced Placement coursework, which other students in the school do. The suit claims that the District is violating the Auberle's students' rights under state and federal laws, including the Equal Protection Clause of the 14th Amendment.

Robert Schaeffer, public education director of Fair Test, which monitors standardized testing states, "Unfortunately, despite the value of Advanced Placement courses, they end up reinforcing huge gaps between haves and have-nots because of differences in where courses are offered" (Feller, 2005, p.2). In an effort to reduce this disparity, the federal government added support to the Advanced Placement program.

2.6 FEDERAL SUPPORT FOR THE ADVANCED PLACEMENT PROGRAM

During the first three decades of its existence, the Advanced Placement program received little support from state governments and no federal funding (Klopfenstein, 2004). This would change dramatically in the 1990's. Advanced Placement programs have become so well received and widespread that they have become the focus of a significant number of incentive programs across the United States; the main goal of these programs is to encourage high school students to pursue advanced educational programs. Much of the growth of the Advanced Placement program over the last decade occurred as the result of state and federal funding increases, which target low-

income students. Much debate over the success of the Advanced Placement program centers on ways of promoting the program in order to increase participation, particularly in schools with a large population of students from lower socioeconomic status. Despite the endorsements by the Secretaries of Education, many high schools nationwide still do not offer Advanced Placement courses. The College Board estimates that almost one-third of all high schools in the United States, in 2007, offered no Advanced Placement coursework (CollegeBoard, 2009b.). Unfortunately, many schools that offer Advanced Placement courses are able to offer only a select few of the 34 different Advanced Placement courses.

Federally, much of funding that is sent to states to defray the cost of the Advanced Placement Program targets increasing diversity. The preponderance of evidence attests to the value of Advanced Placement coursework which prepares high school students for college by offering college-level courses. The road ahead is apparent; federal funds have been earmarked to promote excellence and reduce equity gaps in the underserved. The federal government sent three million dollars and four million dollars, respectively, in 1998 and 1999 (U.S. Department of Education Press Releases, 1998). In announcing the grant monies, then Secretary of Education Riley remarked, “I want everyone to know that funds will be available if you do the work and prepare for college level courses” (p. 1). The importance of the Advanced Placement experience was endorsed by the subsequent Secretary of Education Rod Paige. His endorsement for the Advanced Placement program was unmistakable, “College entrance exams reveal that young people who take challenging classes, such as Advanced Placement courses, perform better than their peers regardless of their family or financial background” (U.S. Department of Education Press Releases, 2001, p.1).

The Access to High Standards Act, which was authorized by the Secondary Education Act of 1965, created two federal programs that support state efforts to construct programs that support low-income student efforts to access Advanced Placement courses and exams (NCLB, Sec. 1701-1706). Resources appropriated under the Secondary Education Act are first used to award money for the Advanced Placement Test Free Program (APTFFP). The remaining funds are then funneled into continuation awards or used to grant new discretionary awards under the Advanced Placement Improvement Program (APIP). Through the APTFFP, federal funds are awarded through an application process to state educational agencies to cover the cost of all, or part, of Advanced Placement exam fees for low-income students.

Once the funding level for APIP is determined, apportionments are first used to cover the cost of continuation awards, funded on a yearly basis for up to three years (Johnson, 2004). Remaining APIP funds may then be given through a competitive awards process to state and local educational agencies and national non-profit organizations that have expertise in advanced placement services. Funds are awarded to qualifying agencies that promote the development and expansion of Advanced Placement programs and courses, specifically in English, mathematics and science in high schools where greater than 40 percent of students come from low-income households. Awarded funds can also be used to facilitate teacher training, books, supplies and course development.

Federal support continues to play a large part in the continued growth of the Advanced Placement program. In 2002, in support of Advanced Placement courses as a model of rigorous curriculum for secondary school students, Secretary Paige, in conjunction with the No Child Left Behind Act (NCLB, 2001) established the Advanced Placement Incentive Program (APIP). This program initially provided \$24 million, annually, in grant awards to state programs that

show an increased number of low-income students who take and succeed in advanced courses (Johnson, 2004). In 2005 the amount was increased to \$52 million to add a teacher training component, in an effort to increase the number of qualified instructors working with low-income students. Since 2002, APIP has provided \$191 million in grant monies to 141 school districts and state educational agencies (Wakelyn, 2009). In 2008, 20 eligible applicants, out of 154 possible applicants, received awards ranging from \$243,690, given to the Weld County School District RE-8 in Colorado, to \$983,013 awarded to Fresno Unified School District in California.

There is limited data indicating the effects of APIP. Though limited, the data do indicate that APIP has provided small, but positive, contributions to Advanced Placement participation (U.S. Department of Education, 2008). The performance indicator for APIP is the ratio of the number of Advanced Placement exams taken and the number of high school seniors in high schools served by APIP grants (similar to Jay Matthews Challenge Index). This ratio has increased. In the 2005-2006 school year the ratio was 0.46. In 2006-2007 the ratio for the grant recipient schools was 0.53 for these same schools, showing a slight increase.

The federal Advanced Placement incentive programs may have contributed to a nationwide increase in Advanced Placement participation. Nationally, since the introduction of the Federal Advanced Placement Incentive Program, the number of Advanced Placement exams has grown by 756,020 reflecting a 93 percent increase (College Board, 2005). Nearly 800,000 high school seniors from the class of 2008 took at least one Advanced Placement exam, compared to 405,000 from the class of 2000 (CollegeBoard 2005-2009). Another positive trend is the decreasing equity and excellence gap among minority and low-income students. 14.5 percent of the public school graduates in 2009, but only 8.2 percent of the population of the students taking Advanced Placement exams. These numbers have increased from previous

years. African American students represented 7.8 percent of the Advanced Placement exam population for the class of 2008, 7.3 percent of the class of 2007, 6.9 percent for the class of 2006, 6.4 percent for the class of 2005 and 6.0 percent for the class of 2004. Figure 1 represents similar trends for Latino students.

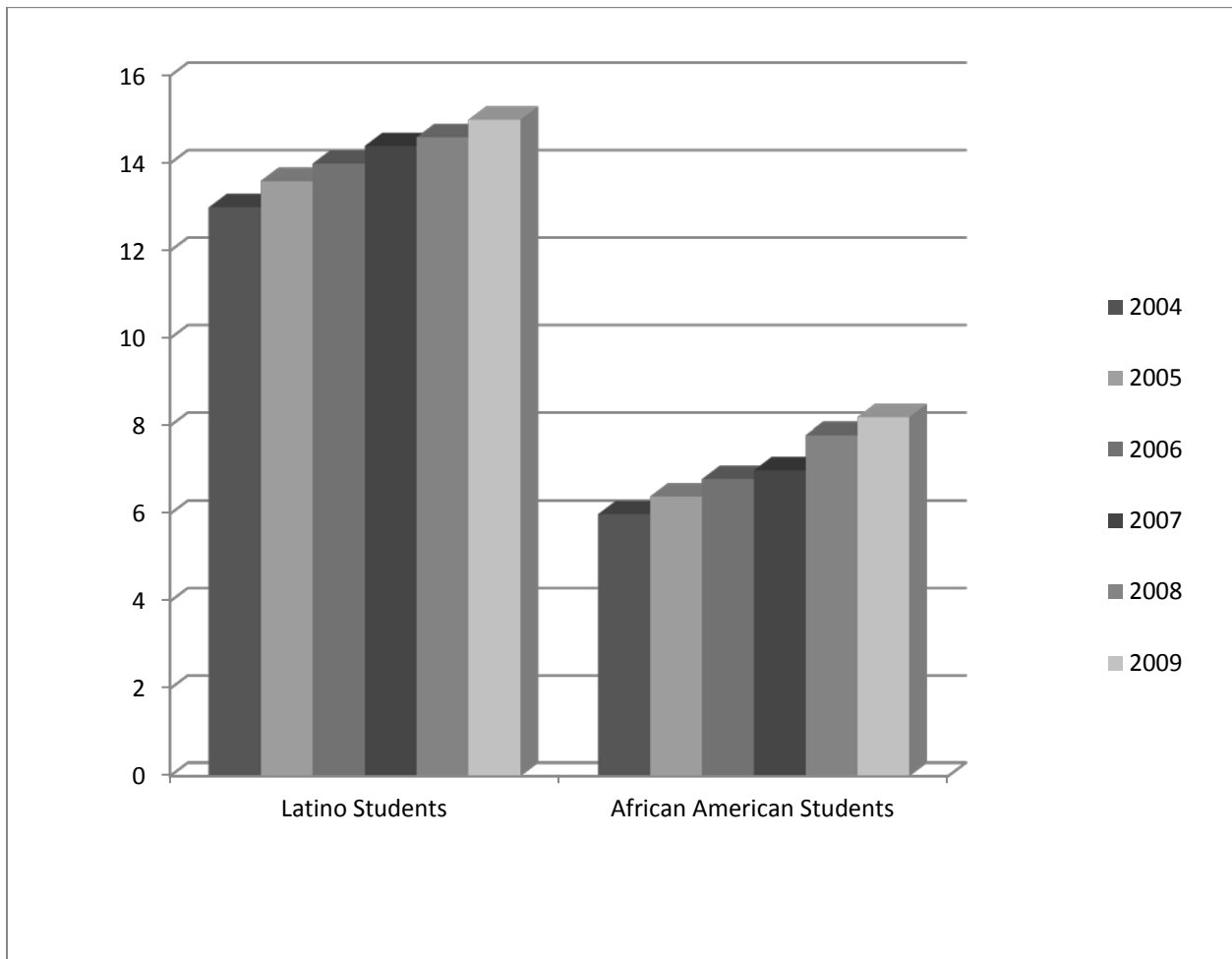


Figure 1. *Advanced Placement Trends for Latino and African American Students*

Note. Adapted from “The Impact of Advanced Placement Incentive Programs,” by M. S. Holstead, T. E. Spradlin, M. E. McGillivray and N. Burroughs, 2010, *Education Policy Brief*, 8, pp. 1-12.

There are few studies regarding students taking Advanced Placement courses who come from low SES backgrounds. Though little data are available, it is possible to track an increase in the number of low income students taking Advanced Placement exams (CollegeBoard, 2009c, 2010). Nationally, nearly 19 percent of students taking Advanced Placement exams from the

class of 2009 were low-income students, compared to only 17 percent of the class of 2008. The classes of 2003 saw only 11.6 percent of their low-income students take Advanced Placement exams. It is also possible to track an increase in the number of low-income students who take, and pass (i.e., score a 3 or above) an Advanced Placement exam. The class of 2009 reported that 14.7 percent of low-income students passed an Advanced Placement exam compared to 9.8 percent of the class of 2003. Although the national trend data are positive, negative data must be recognized. Despite the fact that an increase in Advanced Placement participation by low-income students has been realized, a decrease in overall success rates may be noted. Nationally, the percentage of low-income students who took an Advanced Placement exam, and scored a 3 or above has actually decreased from 64.4 percent in 2003 to 60 percent in 2009. According to the CollegeBoard (2010), the equity and excellence gap has narrowed over the years of the program's existence. However, a gap continues to exist in Advanced Placement program success rates for certain minority populations, especially for African American students, which comprised only 3.7 percent of the student population scoring a 3 or better on Advanced Placement exams. In 48 states, an equity and excellence gap regarding Advanced Placement participation and performance exists for African American students. This gap is slightly smaller in regard to Latino students, existing in 35 states, and smaller still for American Indian/Alaska Native students, existing in only 32 states.

Other federal initiatives that support the traditionally underserved include: African American Student Achievement Initiative, AP Start-Up Grants, AP Fellows Program, and the National AP Equity Colloquium (CollegeBoard, 2008). Former Secretary of Education, Margaret Spellings, who supported the Advanced Placement Program, was encouraged by the increase in minority students enrolled in the program. President Bush's administration endorsed

the Advanced Placement Program by proposing \$52 million in the 2006 budget allocated to Advanced Placement and International Baccalaureate programs. This federal allocation was in conjunction with the No Child Left Behind Act (White House Press Release, 2005).

With federal support for the Advanced Placement program came state support. The next section reviews state support for the Advanced Placement program.

2.7 STATE SUPPORT FOR THE ADVANCED PLACEMENT PROGRAM

The College Board's Advanced Placement Equity Policy was created to encourage the elimination of barriers that restrict access to Advanced Placement courses for underrepresented students (Klopfenstein, 2004). By the mid-1990's financial support for the Advanced Placement program could be found in more than 20 states. In the last decade, the Advanced Placement program has become so well received that Advanced Placement Incentive programs began to spring up nationwide. The main goal of these incentive programs is to encourage high school students to embrace rigor, while in high school, and enroll in Advanced Placement coursework.

The Impact of Advanced Placement Incentive Programs published as an Education Policy Brief by the Center for Evaluation & Education Policy asked and investigated the following question: Are Advanced Placement incentive programs beneficial in increasing implementation of Advanced Placement programs and do they foster successful participation from students in Advanced Placement courses (Holstead, Spradlin, McGillivray & Burroughs, 2010)? As shown in Table 5, these incentives generally fall into three categories: financial incentives, scholarship incentives and accountability incentives.

Financial incentives, which include federal monies for Advanced Placement programs and also state funding for school Advanced Placement course budgets, are commonly used to increase student participation in Advanced Placement programs (Holstead et al., 2010). Many state and local educational agencies, as well as other nonprofit groups, have created additional financial incentive plans. All states, with the exception of Oregon, subsidize at least a part of exam fees for low-income students. Another financial incentive approach is paying cash bonuses to students achieving passing scores. Teachers are also given bonuses for their students attaining pre-set performance targets.

Accountability incentives are another form of Advanced Placement incentives. Schools can only qualify for AP funding from the federal government if they disclose school and student demographics (i.e., number of students in the school, number of students taking the Advanced Placement exam, students' sex, ethnicity, English proficiency, socioeconomic status) (Holstead et al., 2010).

More recently, several states have created scholarships for students who take, and pass Advanced Placement exams. States award financial scholarships, or waive tuition based on student success. For example, Massachusetts waives tuition, for eight semesters, at state post-secondary establishments if students pass two Advanced Placement exams, with a score of 3 or higher, and maintain a 3.3 GPA (Massachusetts Trial Court Law Libraries, 2011). Arizona, Massachusetts and Kentucky include Advanced Placement performance as a requirement for certain state scholarships (Wakelyn, 2009).

Table 5. *Advanced Placement Incentive Programs by State*

State	Financial Incentives	Accountability Incentives	Scholarship Incentives
Alabama	✓		
Arizona			✓
Arkansas	✓	✓	
California		✓	
Colorado		✓	
Florida	✓		
Indiana	✓	✓	
Kentucky		✓	✓
Maryland		✓	
Massachusetts	✓		✓
Michigan		✓	
Minnesota	✓		✓
Mississippi			
Missouri	✓	✓	
New Hampshire		✓	
New Jersey		✓	
New Mexico	✓		
Ohio		✓	
Oklahoma	✓	✓	
Texas	✓	✓	
Utah	✓	✓	
Virginia		✓	
West Virginia		✓	
Wisconsin	✓	✓	

Note. States without incentive programs have been left out of the table. Financial incentives do not include programs for subsidizing test fees. Adapted from “The Impact of Advanced Placement Incentive Programs,” by M. S. Holstead, T. E. Spradlin, M. E. McGillivray and N. Burroughs, 2010, *Education Policy Brief*, 8, pp. 1-12.

2.7.1 California

In 1998, in response to charges of inequities in Advanced Placement program access, California created the AP Challenge Grant Program. *Daniel v. California*, No. BC214156 (*Daniel v. California*, 1999.), a lawsuit filed on behalf of African-American and Latino students claimed disparities in the quality and extent of educational opportunities, violating the plaintiffs' constitutional and statutory rights. The lawsuit claimed that the plaintiffs' high school offered far fewer Advanced Placement courses of poorer quality than those offered in the predominantly white, affluent school districts and that this was tantamount to discrimination. The California state legislature in 1999, in an effort to help correct these inequities, authorized the largest single grant in the 20 years that there has been state funding for Advanced Placement examinations. The Challenge Grant Program, a \$16.5 million grant, was created to increase Advanced Placement opportunities in the 550 public high schools in California (AP Yearbook, 2000).

White, suburban middle-class students have historically dominated the College Board's Advanced Placement Program. Previously, minority students (i.e., African American, Hispanic/Latino, and Native American/Alaska students) have been only represented in small numbers in the program, but, largely due to lawsuits like *Daniel v. California*, great strides have been made in the last five years. The proportion of Hispanic/Latino students who take Advanced Placement exams now equals the overall makeup of their population in U.S. public school system (CollegeBoard, 2005; Lewin, 2006). In the last 10 years, black students taking the Advanced Placement exam have tripled their numbers, to 68,000, and the number of Latino students has nearly quadrupled to 151,000.

2.7.2 Texas

Many states, including Texas have implemented their own Advanced Placement incentive programs. Texas implemented an incentive program in 1996 (Jackson, 2007). In its first year, only 10 schools in the state participated in the program. Currently, more than 60 schools across the state are involved. Participating schools have similar demographics. Characteristically, most Texas APIP schools have a large student body, large percentages of African American and Latino students and a lower percentage of White students.

The Texas program has a financial based incentive for both teachers and students centered on performance (Jackson, 2007). Although the monetary amount varies by district, students earn between \$100 and \$500 for each passing score on eligible Advanced Placement courses. Lead teachers, teachers who instruct Advanced Placement students and Advanced Placement classroom teachers, can earn an annual bonus of \$3,000 to \$10,000, plus an additional \$2,000 to \$5,000 based on the results of their students. Advanced Placement teachers can earn \$100 to \$500 for each passing score of 3 or higher earned by students in their courses. To encourage student participation in the Advanced Placement program, Texas schools have targeted school culture. They have attempted to make Advanced Placement coursework the norm. This has been done by teachers and guidance counselors touting the benefits of college and the Advanced Placement program.

Generally, the results for the Texas APIP have been positive. Since the initiative began, the number of students scoring above 1100 on the SAT or above 24 on the ACT has increased by 30 percent (Jackson, 2007). The number of high school students attending a Texas college has increased by 8 percent. These results are likely due to stronger student encouragement from

counselors and teachers to enroll in Advanced Placement coursework, as well as better information provided to students and changes in teacher and peer norms.

Advanced Placement incentive programs have been created in many Texas school districts with large populations of low-income and minority students (Dougherty et al., 2005). The O'Donnell Foundation, in Dallas, Texas, which has funded many Advanced Placement incentive programs, which primarily subsidize test fees for low-income students, is one of the most successful (Klopfenstein, 2004). These incentive programs have led to a substantial increase in the numbers of low-income and minority students participating in Advanced Placement courses and experiencing exam success. Dallas is a district that has a student population that is made up of 76 percent low-income and 93 percent minority students. Between the years 1995 and 2003 the percentage of low-income students in Advanced Placement incentive programs and passing the Advanced Placement exam increased six times from 0.4 percent to 2.9 percent. In Advanced Placement incentive programs in magnet schools the percentage increased ten times from 0.6 percent to 6.8 percent.

2.7.3 Florida

In 2000, Florida instituted an Advanced Placement Incentive Program designed to encourage minority and underrepresented student participation in Advanced Placement coursework and postsecondary education. The program is entitled the Florida Partnership for Minority and Underrepresented Student Achievement (Bush, 2009). The Florida incentive program, offers a variety of services (i.e., teacher training, student skills assessment, and college entrance examination preparation). It is interesting to note that the Florida Department of Education uses the College Board to provide these services.

Florida's Advanced Placement incentive program, like that of Texas, also extends financial incentives to teachers for successful Advanced Placement programs (Bush, 2009). The state instituted a Teacher Bonus of \$50 for each student that passes an Advanced Placement exam (\$2000 maximum bonus). Unlike Texas, however, Florida rewards individual schools for their accomplishments. The School Bonus is \$700 per student who passes an Advanced Placement exam. Florida has also instituted free PSAT's for all tenth grade students, with scores used to evaluate and identify students who are likely to be successful in Advanced Placement classes.

The partnership has been effective in growing the Advanced Placement program in Texas. In 1999, approximately 50,000 Advanced Placement exams were taken in Florida; in 2008, over 200,000 exams were taken (Bush, 2009). Passing scores have also dramatically increased. In 2008, there were 88,279 passing scores in comparison with only 32,775 passing scores in 1999. This reflects a 169 percent increase in a ten year period. Although a dramatic increase, more students are not finding success in the Advanced Placement program when the actual percentage of students who pass Advanced Placement exams is calculated from the population of Advanced Placement test takers. In 1999, over 50 percent of the students who took an Advanced Placement exam received a passing score, while in 2008, less than 50 percent passed.

2.7.4 New York

In 2007, New York City created an incentive program called Rewarding Achievement (REACH) to increase Advanced Placement participation (Rewarding Achievement, n.d.). The program was launched by The Council of Urban Professionals and the Pershing Square Foundation, with the

intent of improving college preparedness and college graduation rates of low-income high school students, particularly from underrepresented racial and ethnic groups. Currently, the program is being offered in 31 high schools with large minority demographics.

Much like Florida, the New York program offers financial rewards for both students and schools. Scholar Rewards range from \$500 to \$1000 for each passing score attained (Rewarding Achievement). In 2009, a total of \$825,000 was awarded to New York City students, the highest amount, \$3,250, was awarded to a Flushing High School student from Queens (Medina, 2009). Free Advanced Placement workshops are offered by the program, to aid in student success. Additionally, schools are rewarded for success with financial incentives called Reach Bonus Grants, which can be used to provide professional development for teachers. Increased course offerings, and to strengthen academic programs. Positive results have been noted. The number of Advanced Placement tests taken at participating high schools has increased in the 2008-2009 school year to 5,436, which is an increase of 800 exams. The number of passing grades on Advanced Placement exams in the same school year, also rose to 1,774, an increase of 300. However, differing from Florida and Texas, the passing rate on Advanced Placement exams rose slightly, from 32 percent to 33 percent.

2.7.5 Indiana

Indiana implemented an Advanced Placement incentive program in 2009. The Indiana state budget appropriated \$953,284 per year, for Advanced Placement programs in Indiana high schools. In an attempt to increase rigor, the legislature also mandated that every high school in

the state of Indiana must offer a minimum of two Advanced Placement courses and every district must provide Advanced Placement math and science courses (Indiana Code [IC] 20-36-3).

In light of the National Math and Science Initiative finding that 80 percent of U. S. jobs from 2009-2019 will require some math and science knowledge, Indiana has made increasing student math and science ability a goal (McElvey, 2009). Indiana legislators have dedicated funding primarily to Advanced Placement math and science courses based on the amount of funds available. The first payment of funds is allotted to Advanced Placement math and science exam fees. The second allotment of funding is to pay for stipends for math and science teacher training. Only when all math and science priorities have been met can state monies be used for other Advanced Placement subjects (IC 20-36-3-8).

Unlike New York, Florida and Texas, Indiana's incentive program goes one step further by tying Advanced Placement scores to accountability incentives (Indiana Department of Education, n.d.). On annual performance reports, school districts must tally the percentage of high school students taking Advanced Placement exams and the percentage of students who pass these exams with a score of 3 or better. These Advanced Placement scores are used to determine placement in the top two categories of Indiana's improvement and accountability system for schools. In order to qualify for the top two performance classifications, exemplary progress and commendable progress, schools must show improvement in the percentage of Advanced Placement exam scores. In an attempt to increase high school rigor, beginning with the class of 2010, Advanced Placement courses will be required for high school students in order to achieve a Core 40 Diploma with Academic Honors. The Core 40 program, which began in the fall of 2007, allows Indiana high school students to earn extra money for their college education (Indiana Department of Education, n.d.). Students who graduate with Core 40 degrees and have

at least a 2.0 GPA can potentially earn state grant awards of up to 90 percent of approved tuition and fees at eligible colleges.

Indiana's Advanced Placement incentive programs have led to positive gains in Advanced Placement participation. In 2009, 13,098 high school students took at least one Advanced Placement exam, an increase over 8,206 in 2003 (CollegeBoard 2010). This reflects a 60 percent increase over a six year period. Nationally, during the same time period, there was a 55 percent increase. However, the percentage of students who took an Advanced Placement exam and had a passing score of 3 or better, decreased from 53.3 percent in 2003 to 50.3 percent in 2009. This reflects a decrease of 3 percent in 6 years. However, the decrease nationally went from 64.4 percent to 60 percent reflecting a 4.4 percent decline over the same period of time. Indiana's concentration on Advanced Placement math and science courses has not produced any different results than those seen in the overall Advanced Placement course results (CollegeBoard 2001-2009).

2.7.6 Advanced Placement Expansion Project: Alabama, Georgia, Kentucky, Maine, Nevada and Wisconsin

Another incentive program that deals with a large multi-state incentive was initiated by The National Governors Association (NGA). The NGA is the nation's only consulting firm dedicated solely to governors and their policy staff (National Governors Association Center for Best Practices, n.d). In an effort to reduce the substantial equity gaps that persist in Advanced Placement enrollment and success on Advanced Placement exams, the National Governors Association Center for Best Practices attempted to define state policies and practices that were needed to involve minority and low-income students in rigorous coursework. As a result of this

investigation The NGA Center for Best Practices, in 2005, launched its program. The incentive program was just one piece of a larger, multifaceted initiative to redesign the American high school. The main goal of this initiative, the Advanced Placement Expansion Project, was to increase the offering of Advanced Placement courses to low-income and minority students (Wakelyn, 2009). Six states were involved in the project: Alabama, Georgia, Kentucky, Maine, Nevada and Wisconsin. One urban and one rural school district from each of the six states were selected as target districts for the project; a total of 51 high schools were involved. The project focused on three strategies critical to creating vital Advanced Placement programs: expanding access to Advanced Placement courses, building student and teacher capability and creating student and school incentives. Despite the fact that the Center believes that a combination of these three strategies is most effective in creating optimal results, states and schools were permitted to use their own strategies to recruit and expand their program. Alabama, Kentucky and Nevada initiated virtual programs to expand their Advanced Placement programs. The introduction of virtual learning technology was especially effective in rural districts where the ability to attract highly qualified teachers was an issue. PSAT scores were used by many school districts to identify students who were likely to succeed in Advanced Placement coursework. In an effort to increase teacher capacity, the NGA Center provided states with a discretionary \$300 for extended professional development for each involved teacher. Student incentives are not monetary, but schools weight Advanced Placement courses an additional point in students' GPA.

As shown in Table 6, the Advanced Placement Expansion project demonstrated that it is possible to raise rigor and get results. Results of the project have been positive in the six target states (National Governors Association Center for Best Practices, n.d). With a total of 55,000 students, the 51 pilot high schools are large enough to be considered a state. If compared with

other similarly sized states during the same time period, the project states outperformed the norm. Mastery performance on the Advanced Placement exam, as defined previously as having a score of 3 or higher, in the states increased 6.6 percent in 2005-2006 to 8.3 percent in 2007-2008. During this same period, the states in the project outpaced similarly sized states which only saw their performance increase from 6.2 percent to 6.5 percent during the same time period. The national average rose from 14.8 percent to 15.2 percent during the same time period. The project saw the number of students enrolled in Advanced Placement courses increases 65 percent over a two year period. The number of low-income and minority students taking Advanced Placement exams more than doubled. The National Governors Association for Best Practices Center professes the belief that by pursuing the three recommended strategies of access, capacity and incentives, the Advanced Placement program could potentially serve as many as 1 million students by 2014 (National Governors Association Center for Best Practices, n.d).

Table 6. Increase in Advanced Placement Enrollment by State

Project State	2005-2006 Number of students in AP courses	2006-2007 Number of students in AP courses	2007-2008 Number of students in AP courses	Two Year Percent Change at Pilot Schools	Minority Enrollment by State by Percent	Minority Enrollment in Schools by percent	2005-2006 Number of Minority Students in AP Courses	2006-2007 Number of Minority Students in AP Courses	2007-2008 Number of Minority Students in AP Courses	Percent Change at Pilot Schools
Alabama	202	357	293	45%	36%	65%	64	152	136	113%
Georgia	1237	2018	2173	76%	36%	37%	364	601	642	76%
Kentucky	1343	1927	2213	65%	11%	19%	93	151	322	246%
Maine	371	631	742	100%	3%	16%	12	33	52	333%
Nevada	710	1169	1661	134%	29%	81%	472	610	1023	117%
Wisconsin	1333	1532	1476	11%	10%	29%	203	255	310	53%
Project Totals	5196	7634	8558	65%	25%	41%	1208	1802	2485	106%

Note. Adapted from “Raising Rigor, Getting Results: Lessons Learned from AP Expansion,” National Governors Association Center for Best Practices, n.d.

2.7.7 Pennsylvania

In Table 4, which represents Advanced Placement incentive programs by state, it should be noted that Pennsylvania is not included. Pennsylvania, currently, does not have a statewide program specifically dedicated to the advancement Advanced Placement coursework. What support there is for Advanced Placement coursework has been brought about by suggestions from the American Diploma Network.

The American Diploma network is a group of 33 states that are dedicated to making sure that every high school graduate is prepared for college or work. In total, Network member states

are responsible for educating nearly 80 percent of all U.S. public school students. Governors, state superintendents of education, college leaders and business representatives are collaborating to bring a higher value to the high school diploma by raising the bar and increasing the rigor of high school curriculums and standards in an effort to greater align them with post-secondary expectations. Pennsylvania has heard the national message concerning rigor and the necessary preparation of high school graduates for success in college and careers. Currently, only 44% of freshman in Pennsylvania's high schools graduate on time with a transcript that is college ready (Gewertz, 2006). There are many reasons for this staggering statistic; however, one clear cause, as cited by the American Diploma Network in its plan for Pennsylvania, is the lack of access to college ready curriculum. The American Diploma Network (n.d.) harshly warns Pennsylvania that, "the state must undertake systemic reform efforts in order for students to be competitive in the 21st century" (p.1).

Based on recommendations for the state of Pennsylvania by the American Diploma Network, Governor Rendell and Secretary of Education Zahorchak, along with the Pennsylvania state Legislature have taken unprecedented strides to raise expectations and improve the quality of the high school experience (Gewertz, 2006). With bi-partisan support, Pennsylvania's 2005-2006 budget more than doubled funding for high school reform.

As a local control state, Pennsylvania approaches high school reform on two distinct levels (Gewertz, 2006). The Pennsylvania Department of Education must bring districts along with targeted supports and simultaneously push for additional statewide quality assurances through regulation and legislation. The Pennsylvania Department of Education, with the support of the Governor's Office and the State Legislature, created and oversees Project 720. The project, named after the number of days in four years of high school, was a three year grant

awarded in cohorts with the first cohort running from July 2004 until June 2007. The purpose of the initial \$4.7 million state grant was to create high schools that are student-centered, results-focused, data informed, and personalized in the delivery of services to students (PSEA, October 2005). The program was based upon recommendations by the American Diploma Project, a national coalition to align standards, assessments, curriculum, and accountability with the perceived demands of higher education and work, in its state plan for Pennsylvania (American Diploma Project, n.d.). The American Diploma Project is a particularly forceful voice for requiring all students to complete a “college-ready” curriculum and for aligning the state assessment to graduation and college admissions.

In 2005-06, the state of Pennsylvania, through Project 720, awarded 67 grants, for cohort two, ranging from \$40,000 to \$168,000 to help high schools build smaller learning communities, improve student counseling services, implement adolescent literacy programs, personalize the high school experience, and raise academic standards (Gewertz, 2008). \$8 million was allocated in the 2006-2007 state budget, and \$11 million was provided in 2007-2008. \$5.3 million was proposed for cohorts two and three in 2008-2009. \$2.8 million was proposed for cohort three in 2009-2010, the third and final year for grant funding. The Pennsylvania Department of Education hopes that the successes experienced by Project 720 schools will serve as models for other schools to emulate.

As previously cited, there are numerous state and federal grant programs that have been created to assist low-income students. What was unique to Pennsylvania’s Project 720 was that the incentives offered to increase academic rigor were extended to all students, despite their socio-economic status. This allowed high school educators and guidance counselors to encourage all students to embrace academic rigor. More importantly, by extending this

educational opportunity to all students, the state of Pennsylvania offered an invaluable educational opportunity to previously unconsidered students; they offered a chance to achieve more.

Pennsylvania appears to be headed in the right direction. Governor Edward Rendell, in an article published in the Pittsburgh Post-Gazette on January 11, 2011, announced that K – 12 education has made great advances (Chute, 2011). Eight years ago, when Governor Rendell took office, the state’s K – 12 educational system was given a C – D rating in the “Quality Counts” report published by *Education Week*. The latest survey gives the state of Pennsylvania a score of B-, or 80.5 percent. The survey ranks the state of Pennsylvania sixth out of the 50 states.

The preponderance of evidence from numerous studies indicates that strong guidance programs within our high schools, along with the availability of college-level coursework, can help eliminate needless waste of human capital. Advanced Placement should be, and is, in Pennsylvania’s Project 720 schools, an accessible Holy Grail that is attainable by all, despite economic status.

2.8 CONCLUSION

If anyone can think of an academic program that in the last decade has had as positive an impact on American public high school as AP, I would like to hear what it is. I can't think of any that comes even close. (Matthews, 2002, p.68)

Why is access to Advanced Placement coursework so important? Although conflicting data have been presented, the influence of the Advanced Placement program in improving academic rigor for high school students and the determination of their future success cannot be denied. During the past decade, the College Board, working with leading states and school districts, has advocated that all students be given the opportunity to experience Advanced Placement coursework. The superintendent of schools in San Diego, California, Terry Grier, has been attributed with saying, "AP is not just for the elite; it's for the prepared" (National Governors Association Center for Best Practices, n.d., p. 3). Since 2000, support from the federal government's Advanced Placement Incentive Program has given \$191 million in grant monies to 140 states and school districts, predominantly to increase access to the Advanced Placement program for underrepresented populations of students.

For students seeking admission to the most competitive colleges and universities, AP scores offer the only national benchmark, other than the SAT or ACT, by which students may be evaluated. College Board (2005) in its very first AP Report to the Nation cited that 45 percent of students who have taken one AP course, and 61 percent of students who have taken two or more AP courses, complete their Bachelor's degree in four years or less. The average for students who enroll in college without having taken an AP course is a dismal 29 percent (Camara, 2003).

It has been reported that, overall, students in the United States lag behind students in other countries in the areas of math and science on international tests. The most encouraging news from Gonzalez et al. (2001), in their study of the TIMSS Advanced Mathematics test and the TIMSS Advanced Physics test, is that American AP students not only can compete in the areas of physics and calculus on an international level, but they also excel.

In 2002 – 2003, over one million students participated in the Advanced Placement program by taking at least one AP exam (Thomas B. Fordham Institute, 2009). During the following four year period, from 2004 – 2008, nearly 1.6 million students took at least one exam, reflecting over a 50% increase in the AP program. Is this growth helping or harming our brightest students? Does this growth reflect an increased desire by students to further intellectual pursuits, or does it arise from utilitarian or pragmatic reasons? There are signs that the current move toward an open door AP admissions policy is starting to cause concern. In an attempt to investigate the growing allure of the Advanced Placement program, the Thomas B. Fordham Institute conducted a survey of over 1,000 Advanced Placement teachers in high schools across the United States. The nation's Advanced Placement teachers felt that despite tremendous expansion, the program's quality has survived. They do, however, see troubling signs: students who are underprepared and parents who push their children into Advanced Placement courses.

The purpose of the research planned that followed this review of the literature was to adapt and extend the study done by the Thomas B. Fordham Institute with a specific focus on high schools in Pennsylvania. Empirical evidence reviewed previously in this body of literature showed a need, in light of the end of Pennsylvania's Project 720, to assess and document AP growth trends in Pennsylvania.

The following questions were addressed through further study:

1. What AP courses are currently offered in Pennsylvania high schools?
2. What gatekeeping measures are in place for AP courses in Pennsylvania high schools?
3. What impact has this growth had on acceptance of Advanced Placement credits in Pennsylvania's institutions of higher learning?
4. What impact has this growth had on acceptance of Advanced Placement credits in Pennsylvania's community colleges?

3.0 RESEARCH METHODOLOGY

Over the past decade, the American public has come to believe that the public school system in the United States is seriously flawed and also that this system is in need of dramatic improvement. Traditionally, Americans have looked to public education as a way to perpetuate democratic ideals of the “American Dream” and ensure economic global competitiveness. Apple (1996) noted that it has become the consensus of the American public that the public school system is no longer equal to the task. As previously stated in this report, the National Commission on the High School Senior Year, *Raising Our Sights: No High School Senior Left Behind* (2001), refers to post-secondary education as a necessity. The commission additionally comments that unless high schools require students to complete a rigorous and demanding course of study, they will grossly limit their students’ opportunities and relegate them to a lifetime of low level jobs, and as a result, decrease human capital.

The commission noted a need to raise awareness in the home. Family resources and knowledge of the educational system create the plan and support necessary for completion of rigorous coursework that is the perfect segue between high school and post-secondary education. Low income, disadvantaged and first generation college students are often forced to rely solely on school support and resources. Without proper warning and stringent guidance, these children and their potential have the propensity to slip through the cracks of our educational system. The

commission further recommends that school districts obtain written, parental permission before assigning high school students to anything below a “college-preparatory” schedule.

The Advanced Placement (AP) program, in existence for over half a century, has become equated with rigor in America’s high schools. Many states have economically supported this belief by creating statewide Advanced Placement Incentive programs, making AP coursework and its result in advanced standing in colleges and universities virtually free to all students who embrace it. Pennsylvania, as evidenced in the previous literature review, has no Advanced Placement Incentive program, and largely because of this, little information regarding the AP program in Pennsylvania has been collected. A database of information would allow policymakers, administrators, teachers, parents and high school students to make informed decisions regarding programming, high school selection, AP course selection, and the selection of institutions of higher learning.

3.1 STATEMENT OF THE PROBLEM

Despite research recommending an increase in rigor in high schools across the nation, we have no central repository of information on Pennsylvania's use of Advanced Placement. The purpose of this study is to investigate the status of Pennsylvania's Advanced Placement Program, a program that has been acknowledged for its rigor. The study will analyze:

- AP acceptance policies for Pennsylvania institutions of higher learning,
- Pennsylvania high school AP requirements, course offerings and student enrollment,
- 2011 Pennsylvania Challenge Index,
- 2nd Annual AP District Honor Roll and
- 8th Annual AP Report to the Nation as evidence of the implementation of the AP program.

These data were collected, organized and analyzed in the attempt to create a comprehensive report of the AP program in Pennsylvania that may be useful to policymakers, parents, students, teachers and school administrators.

This chapter describes the research questions, data collection procedures and proposed data analysis to study critical documents related to the Advanced Placement program in Pennsylvania.

3.2 RESEARCH QUESTIONS

To analyze the state of the AP Program in Pennsylvania, this study focused on the following research questions:

1. Which traditional public high schools in Pennsylvania are involved in the AP Program?
Are the number of AP courses offered and the number of students enrolled directly related to school population, geographic location or the socio-economic status of the student population?
2. What acceptance policies and requirements are in place in Pennsylvania institutions of higher learning regarding the granting of AP credits?

3.3 OPERATIONAL DEFINITIONS

Because this study referred specifically to many terms used frequently in the field of education, this study used the terminology and operational definitions defined in Table 7.

Table 7. *Operational Definitions*

TERM	DEFINITION
Academic Resources Index	A composite measure of the academic content and performance that the student brings from secondary school into higher education. This index produces a much steeper curve toward bachelor's degree completion than socio-economic status. (Adelman, 1999)
Advanced Placement Improvement Program (APIP)	Through the Advanced Placement Test fee Program (APTFP). Federal funds are awarded through an application process to state educational agencies to cover the cost of all, or part of Advanced Placement exam fees for low income students.
Advanced Placement Program	Begun in the mid 1950's, the AP program was created as a means to retain bright students in their home high schools, while pursuing college level work. AP courses are taught by high school teachers, following a prescribed curriculum. A standardized examination is administered in May, and depending on the student's score and the college or university the student will attend, college credit may be granted.

<p>Advanced Placement Test Fee Program (APTFFP)</p>	<p>The Secondary Education Act of 1965 created this federal program that supports state efforts to construct programs that support low-income student efforts to access Advanced Placement courses and exams.</p>
<p>Catching-Up Schools</p>	<p>The index is a national and statewide ranking of high schools appearing annually in <i>Newsweek Magazine</i>. Created by Jay Matthews, the ranking is determined by the ratio of a high school's graduating seniors and the number of Advanced Placement exams taken; however, fewer than 10 percent of the AP tests taken receive a passing score (3, 4, 5).</p>
<p>Challenge Index</p>	<p>The index is a national and a statewide ranking of high schools appearing annually in <i>Newsweek Magazine</i>. Created by Jay Matthews, the ranking is determined by the ratio of a high school's graduating seniors and the number of Advanced Placement exams taken.</p>
<p>Free and Reduced Public Lunch (FRPL)</p>	<p>Free and Reduced Public Lunch refers to students whose families qualify for a free or reduced lunch rate in the public school system. This benchmark is often used to determine financial need in education.</p>
<p>First Generation College Student</p>	<p>A high school student who, upon entering post-secondary study, will become the first member of their family to attend a college or university.</p>
<p>Gatekeeping</p>	<p>In reference to the Advanced Placement program, the practice of regulation, or non-</p>

	regulation, of students allowed to take AP coursework.
Human Capital	The supply of skill and knowledge embodied in the ability to perform labor in order to produce economic value.
Pattern Matching	In data analysis, an attempt to link two patterns where one is a theoretical pattern and the other is an observable or operational one (Trochim, 2006).
Project 720	A Pennsylvania high school reform initiative grant. The grant encourages high schools to create reform strategies that change the high school environment to one that is rigorous and enhances student access to post-secondary educational opportunities. An initial \$4.7 million were proposed in Governor Edward G. Rendell's 2005 – 2006 budget to fund cohort one districts. The grants are awarded on the basis of commitment to key strategies targeted at creating high performing high schools (Governor Rendell announces High School Reform Grants, 2007).
Rigor	A set of ideas, principles and strategies that lead to a desired outcome – for our purposes, all students well prepared for post-secondary education (Waits, Setzer, Lewis & Greene, 2005).
Socio-economic Status (SES)	Socio-economic status is based on family income, parental educational level, parental occupation, and social status in the community (Demarest et al., 1993).

3.4 DATA COLLECTION PROCEDURES

In research studies, there is inherent value in combining both qualitative and quantitative methods, and therefore, adopting a mixed methods approach. Qualitative research methods were used to address each of the research questions previously identified. Instead of trying to prove or disprove a hypothesis, qualitative research looks for themes, theories, and general patterns to emerge from the data. Qualitative research “is hypothesis generating” (Merriam, 1988, p.3) rather than serving to test a hypothesis.

Data were collected regarding AP student numbers, SES, course offerings, and requirements. These quantitative student data were categorized according to similar themes and patterns.

This researcher employed a descriptive case study method. Yin describes the case study research method as, “an empirical inquiry that investigates a contemporary phenomenon within its real-life context” (Yin, 1989, p.23). Merriam (1988) concurs with Yin (1989) by providing a definition of the case study as an investigation of a specific phenomenon such as an institution, a program, an event, a process, a social group or a person.

This researcher mined documents (Merriam, 1988) all of which are available in the public domain. Documents were collected from a variety of sources. These sources for documents for Research Question One are listed in Table 8. The sources for documents that apply to Research Question Two are listed in Table 9 and include, but are not limited to: individual websites for institutions of higher education in Pennsylvania, individual websites for traditional public high

schools in Pennsylvania, the 6th Annual AP Report to the Nation, the National Center for Education Statistics, the AP Achievement list by state and district, the Challenge Index for Pennsylvania, and Catching - Up Schools in Pennsylvania. Documents selected for this case study included those making direct reference to the Advanced Placement Program in Pennsylvania. The specific data collection procedures are delineated in Tables 8 and 9.

Table 8. *Data Collection Procedure for Research Question 1*

Research Question 1: Which traditional public high schools in Pennsylvania are involved in the AP Program and to what degree are they involved?

Category of Data	Source	Data Collection Procedure
1. Traditional Public High School AP policies and participation	1. Pennsylvania Department of Education’s listing of all traditional public high schools in Pennsylvania 2. Individual high school websites	1. Go to the high school website 2. Search using “Advanced Placement” as a search term 3. Place information found in the appropriate categories on the Excel spreadsheet 4. If no results are found, use the <u>Google</u> search engine and search using the name of the high school and the term “Advanced Placement”

		<p>5. Search articles identified in the search results for pertinent data</p> <p>6. Place information found in the appropriate categories on the Excel spreadsheet</p> <p>7. Inter-rater reliability will be checked.</p>
2. 2011 AP District of the Year Awards	<p>College Board Inspiring Minds</p> <p>http://www.collegeboard.com/student/testing/ap/scholarawards.html?print=true</p>	<p>1. Review document</p> <p>2. Record data into high school spreadsheet</p>
3. 2011 AP Challenge Index for Pennsylvania	<p>The Washington Post</p> <p>http://apps.washingtonpost.com/highschoolchallenge/schools/2011/list/Pennsylvania-schools/</p>	<p>1. Review document</p> <p>2. Record data into high school spreadsheet</p>
4. 2011 Catching Up Schools for Pennsylvania	<p>The Washington Post</p> <p>http://apps.washingtonpost.com/highschoolchallenge/schools/2011/list/Pennsylvania-schools/</p>	<p>1. Review document</p> <p>2. Record data into high school spreadsheet</p>
5. 7 th Annual AP Report to the Nation	<p>College Board Inspiring Minds</p> <p>http://www.collegeboard.com/html/aprtn/pdf/ap_report_to_the_nation_pdf</p>	<p>1. Review document</p> <p>2. Record data into high school spreadsheet</p>

Table 9. *Data Collection Procedure for Research Question 2*

Research Question 2: What acceptance policies and requirements are in place in Pennsylvania institutions of higher learning regarding the granting of AP credits?

Category of Data	Source	Data Collection Procedure
1. Higher Education AP policies	1. On Line Research Site for Pennsylvania Colleges and Universities http://www.collegesofpa.com/ 2. Individual college, university and community college websites	1. Go to the Higher Education website 2. Search using “Advanced Placement” as a search term 3. Place information found in the appropriate categories on the Excel spreadsheet 4. If no results are found, use the <u>Google</u> search engine and search using the name of the college, university or community college and the term “Advanced Placement” 5. Search articles identified in the search results for pertinent data 6. Place information found in the appropriate categories on the Excel spreadsheet

3.5 DATA ANALYSIS

Yin (2003) recommends pattern matching as an approach to connecting the data to the propositions. Pattern matching is an attempt to link two patterns where one is a theoretical pattern and one is an observed or operational one (Trochim, 2006). Through data analysis, similar patterns can be identified and linked back to the propositions, new propositions based on “relationships discovered among data” (Merrriam, 1988, p.20) can be made, and theoretical categories and emerging themes can be built. Through my document analysis these patterns were discovered and explored.

Processes for data collection for case studies are more complex than other research strategies. Yin recommends following certain “formal procedures to ensure quality control during the data collection process” (Yin, 2003, p. 106). He described three principles of data collection that help ensure the quality of this process:

1. Using multiple sources of evidence
2. Creating a case study database
3. Maintaining a chain of evidence.

The reliability of the study is increased through the process of triangulation, where converging lines of inquiry are developed from the multiple sources of evidence. Triangulation, in this case study, was achieved through the examination of multiple sources.

Creating a case study database is the process of organizing the data in a way that other investigators are able to review it directly. In this study, the researcher used the folder system on the computer to collect and store all of the data and an Excel database to record events and categorize the data. Two Excel spreadsheets were used to record data: one for AP admission

policies in Pennsylvania institutions of higher learning, and the second containing AP information for secondary schools in Pennsylvania.

There are 160 institutions of higher learning in Pennsylvania; this researcher will collect all relevant data pertaining to admission policies. Because of the vast amount of data collection involved in researching 720 public high schools in Pennsylvania, a research assistant was involved in this study. Researcher instructions appear in Appendix A of this document. Inter-rater reliability was checked for consistency in the data mining process by a comparative method. After researching the first 57 high schools, or ten percent of the total listed alphabetically in the Pennsylvania high school AP spreadsheet, this researcher and the research assistant compared the data collected for congruence and accuracy.

The spreadsheet containing the data for higher education AP admission policies were divided into five categories:

1. state related colleges and universities,
2. state owned colleges and universities,
3. private colleges and universities,
4. private liberal arts colleges, and
5. community colleges.

Additional data that was collected included: number of AP exams accepted for credit, passing score accepted by institution, conditions for granting credit or waiver, and exceptions.

The spreadsheet containing the data for traditional public high schools included:

1. high school name and address,
2. county,
3. student population,

4. percent of Free and Reduced Lunch students,
5. number and type of AP courses offered,
6. number of students enrolled in AP courses,
7. number of AP exams taken,
8. gatekeeping measures,
9. mandatory AP testing, and
10. Challenge Index rating.

Maintaining a chain of evidence increases the reliability of the study by providing a way for an external investigator to “trace the steps in either direction (from conclusion back to initial research questions or from questions to conclusions)” (Yin, 2003, p. 105). The chain of evidence desired is the ability to cross-reference between the case study report, the databases, citations to specific sources in the database and the research questions. This chain of evidence was maintained throughout the study.

Glesne and Peshkin (1999) states that “Data analysis involves organizing what you have seen, heard, and read so that you can make sense of what you have learned. Working with the data, you create explanations, pose hypotheses, develop theories, and link your story to other stories” (Glesne & Peshkin, 1999, p. 130). After collecting the data from Pennsylvania high schools and institutions of higher learning, patterns, consistencies and inconsistencies were used to develop themes relevant to the AP program in Pennsylvania.

3.6 LIMITATIONS

Inherent biases exist in the nature of this study. One bias assumes that post-secondary success is a valuable goal for all students. There is also an assumption that there are many students of low SES who are not participating in the Advanced Placement Program, due to the cost of testing. The presumption also exists that with increased funding, the number of students who are successful in Advanced Placement coursework will increase, as well. There is little room for measurement of inherent student motivation and tenacity, as well as parental values.

One can also challenge the belief (bias) surrounding the value that the American educational system places on using the Advanced Placement route to create successful scholars. Paul (2005) explains that “Good performance conforms to what is accepted in the ‘social circle’ of the knower” (p.247). Careful consideration must be given to cultural biases inherent in the educational system, as well as the cultural capital of the low income students participating in the Advanced Placement Program. Paul (2205) also states that there is a need to remind “educators at all levels...of the specific influences culture has on learning and schooling” (p. 167).

Further, the document review is selective of works that represent an attempt to develop theoretical constructs. The selected examples in no way completely exhaust the literature that can be found on this topic. Although all institutions of higher learning in Pennsylvania were investigated, and public high schools including cyber and charter schools were used, due to the large number of public high schools, private high schools will not be included. The intent of this study is to determine Advanced Placement program guidelines and parameters, as well as to validate perceptions of rigor, as defined by student involvement in the Advanced Placement

Program, found in schools with similar and dissimilar student representations and geographic locations.

4.0 RESULTS

This chapter presents the results found through the document review of public information. The documents reviewed were from the Pennsylvania Department of Education (PDE), individual websites for institutions of higher learning as listed by the Pennsylvania Department of Education, and individual websites for public high schools as listed by Department of Education, and also included other public domain documents. Other documents reviewed included:

- The 8th Annual AP Report to the Nation
- The National Center for Education Statistics
- The Project 720 Site Visit Report (2007-2008)
- The AP Achievement list by state and district
- The 2nd Annual AP District Honor Roll
- Challenge Index for Pennsylvania
- Exhibits 1, 2, and 3 of Allegheny County Advanced Placement 2010-2011 Results, presented by Stephen Zori, Educational Manager K-12 services, College Board, at the Allegheny Intermediate Unit 3 Curriculum Director's Meeting held November 11, 2011

Documents selected for this case study include those making direct reference to the Advanced Placement Program in Pennsylvania.

The premise for this study arose during research for the literature review. It was noted that there was a lack of information compiled on the Advanced Placement Program in the state of Pennsylvania. Because Pennsylvania does not have a statewide AP incentive program, as many other states do, little information has been available to researchers, policymakers, and educators. Project 720, a competitive grant for public high school reform in Pennsylvania, was intended to increase rigor. In 2004, PDE introduced Project 720 and allocated \$4.7million state grant program supporting public high school reform. Eligible school districts were chosen through a competitive grant process. However, despite the fact that annual data reports were required of the grant recipients, little data, if any, were released to the public. The Project 720 2007-2008 Site Visit Report, issued in September of 2008, presented a picture of 20 schools. Of those 20 schools, the majority of funds were used for remediation and literacy coaching. Only three school districts, Mohawk, East Allegheny Area and Fleetwood Area, utilized Project 720 funding for increasing rigor via the Advanced Placement Program.

Because no aggregated reports exist, the document mining process was lengthy and tedious. This researcher investigated over 650 Pennsylvania public high school websites with related articles focusing on Advanced Placement, 70 Pennsylvania cyber/charter high schools and 150 institutions of higher learning. The data were compiled in three separate databases. These databases were coded and analyzed by determining common threads of data that referenced the two research questions. Accordingly, the results are presented in two sections that detail the findings related to the two research questions: (1) Which public high schools in Pennsylvania are involved in the AP Program? Are the number of AP courses offered and the number of students enrolled directly related to school population, geographic location or the socio-economic status of the student population?

(2) What acceptance policies and requirements are in place in Pennsylvania institutions of higher learning regarding the granting of AP credits?

4.1 RESEARCH QUESTION ONE: WHICH PUBLIC HIGH SCHOOLS IN PENNSYLVANIA ARE INVOLVED IN THE AP PROGRAM? ARE THE NUMBER OF AP COURSES OFFERED AND THE NUMBER OF STUDENTS ENROLED DIRECTLY RELATED TO THE SCHOOL POPULATION, GEOGRAPHIC LOCATION OR THE SOCIO-ECONOMIC STATUS OF THE STUDENT POPULATION?

As mentioned previously in Chapter 3 of this study, every public high school in Pennsylvania was investigated. The information related to high schools were collected and stored on Excel spreadsheets and separated into two separate databases: one containing information concerning traditional public high schools and the second focusing on cyber/charter high schools.

Therefore, the high school results were bifurcated into findings relating to a) Pennsylvania cyber/charter schools and b) traditional public high schools in Pennsylvania.

4.1.1 Pennsylvania Cyber/Charter High Schools

In researching public high schools in Pennsylvania, an invaluable resource was information contained on the Pennsylvania Department of Education's website. Contained on PDE's website were data regarding:

- Student population
- Percent Free and Reduced Lunch (which was used as a determination of SES)
- Number of Students enrolled in AP courses
- AP courses offered

These data were collected by PDE using the Pennsylvania Information Management System (PIMS), which is a statewide longitudinal data system used to record information reported by all educational entities in the state of Pennsylvania. The data collection for this study was based on the list of public high schools and pertinent information, both traditional and cyber/charter, found on the PDE website for the 2010 – 2011 school year. The high schools were studied by geographic location as determined by county; 22 counties out of the total of 67 counties in Pennsylvania housed cyber/charter schools.

It became evident during the research process that, when compared to the traditional public high schools websites, many of the cyber/charter high school websites visited were found lacking. Many were outdated, with Curriculum Guides for the 2008-2009 school year the most recent available; the website for La Academia listed its most recent updating as May 22, 2009. Few had school Curriculum Guides posted, which is where AP gatekeeping measures and AP course information is commonly found. As a direct result of this, little AP information, other than that which was posted on the PDE website, was found. Gatekeeping measures appeared for

only two of the 70 cyber/charter schools. It was obvious through the information on these websites that rigor was not of main importance. Most websites contained links to Title I, a federally funded remedial reading program based upon the school's number of disadvantaged students, and Free and Reduced Lunch applications but made little or no mention of AP coursework.

The preponderance of cyber/charter high schools in the state of Pennsylvania are located in the Philadelphia area. As Philadelphia is the largest school district, by student population, in Pennsylvania, with 34 traditional public high schools, this was not surprising. What *was* surprising was that 32 of the 70 cyber/charter high schools in Pennsylvania, or 46%, were located in Philadelphia. The need for this type of nontraditional schooling may be viewed as a commentary on the state of the educational system in Philadelphia.

Of the 32 cyber/charter schools listed on the PDE website located in Philadelphia, AP courses were offered in 14 of the 32 schools. This reflects a 45% participation rate. Figure 2 illustrates the participation percentage.

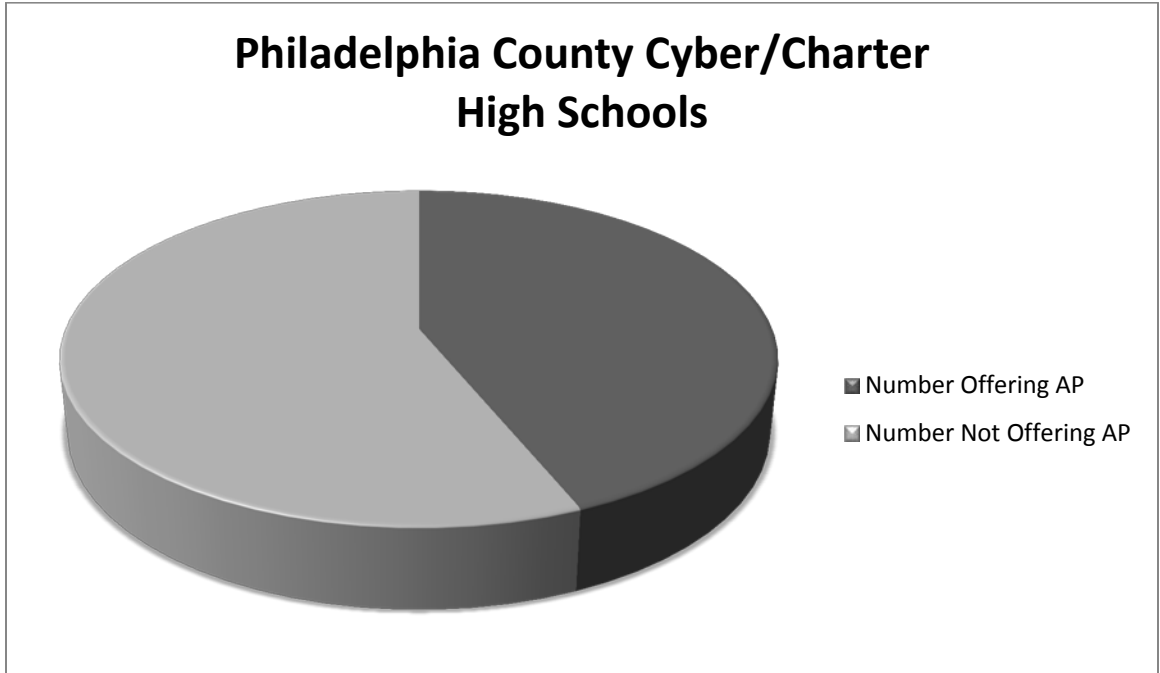


Figure 2. *Advanced Placement Trends in Philadelphia County Cyber/Charter High Schools*

SES levels for the Philadelphia cyber/charter high schools, as determined by Free and Reduced Lunch percentages range from 22.8% to 100% with no obvious parallel related to the number of AP courses offered. Community Academy of Philadelphia Cyber School offers the highest number of AP courses (10) and has a Free and Reduced Lunch percentage of 48.1%; Eastern University Academy Cyber School with a Free and Reduced Lunch percentage of 22.6% offers none.

Of the 14 schools offering AP coursework, only Boys Latin of Philadelphia listed any information regarding their AP Program on their website. It was noted that permission from AP instructors was required in order for the students to enroll in AP English Language and Composition and/or AP Art History. Twenty of the 462 students, or four percent enrolled in the two AP courses for the 2010-2011 school year. Community Academy of Philadelphia Cyber

School, which offers the highest number of AP courses (10) in Philadelphia County, reports that 338 students of their 581 students, or 58 percent enrolled in AP coursework for the 2010 – 2011 school year, despite having a Free and Reduced Lunch Percentage of 48.1%.

Allegheny County, home of The Pittsburgh Public Schools, houses eight of the 70 statewide cyber/charter schools within its boundaries. This reflects 11% of the Pennsylvania cyber/charter school population. Of the eight cyber/charter schools, AP coursework is offered in only three of the schools, representing offerings in 38% of the Allegheny County cyber/charter schools. Figure 3 illustrates the participation percentage.

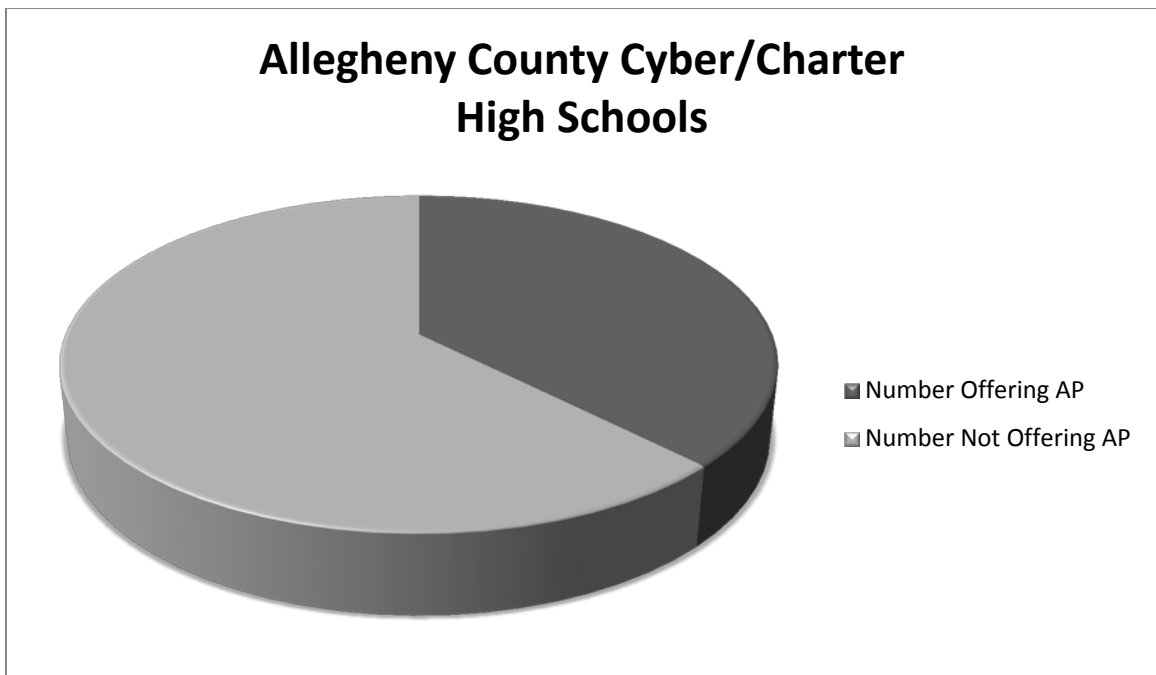


Figure 3. *Advanced Placement Trends in Allegheny County Cyber/Charter High Schools*

SES levels for the Pittsburgh cyber/charter high schools, as determined by Free and Reduced Lunch percentages range from 39.4% to 88.7% with no obvious parallel related to the number of

AP courses offered. For example, Northside Urban Pathways Cyber School, with 88.7% of its students qualifying for the Free and Reduced Lunch Program, offers five AP courses with 127 of their 200 students enrolled in AP work. Pennsylvania Distance Learning Cyber School, with 39.4% of its students qualifying for the Free and Reduced Lunch Program, also offers five courses, but only 24 of their 176 students are enrolled.

It is interesting to note that Central Pennsylvania Digital Learning Foundation Cyber School, located in Altoona, Pennsylvania, offers 20 AP course, the most of any cyber/charter school. Yet, no students are reported to be currently enrolled in any classes. The Free and Reduced Lunch percentage for Central Pennsylvania Digital Learning Foundation Cyber School is 47.2%, neither high nor low. It is also interesting to note that all cyber/charter schools could offer just as many AP courses by using the same on-line courses provided through the Florida Virtual School. The AP courses that Central Pennsylvania Digital Learning Foundation Cyber School offers its students are provided through the Florida Virtual School, at an additional cost of \$475 plus materials. The cost of student materials varies from \$42 to a high of \$204, a costly endeavor for any student.

As stated previously in this report, the information regarding Advanced Placement on cyber/charter websites was scant. It is the opinion of this researcher that this lack of information equates to a lack of interest in recruiting students to rigorous high school course offerings by both students and administration. The SES as determined by the Free and Reduced Lunch percentage of each cyber/charter appeared to have little to do with course offerings in the larger counties of Allegheny and Philadelphia. Geographic location seemed to be more of a determining factor in Chester County, located in suburban Philadelphia, as it had AP courses offered in all seven of its cyber/charter schools. Chester County cyber/charter schools also had

the lowest number of students qualifying for the Free and Reduced Lunch Program. Congruently, Chester County included eight school districts qualifying for the College Board's 2nd Annual AP District Honor Roll. To explain, 367 school districts in the United States and Canada were selected for both increasing access to Advanced Placement coursework and maintaining or increasing the percentage of students scoring 3 or above on AP exams. Districts who make the honor roll are believed by the College Board to be successfully identifying motivated, academically prepared students who are likely to benefit most from AP coursework (CollegeBoard, 2011).

4.1.2 Pennsylvania Traditional Public High Schools

The data for the Pennsylvania traditional high schools were gathered predominantly by using the PDE website and individual high school websites. These data were then divided by county and stored on individual county spreadsheets. Pennsylvania's 67 counties are represented in Table 10.

Table 10. *Pennsylvania Counties*

<i>Pennsylvania Counties</i>								
Adams	Bucks	Clearfield	Erie	Jefferson	Lycoming	Northumberland	Sullivan	Westmoreland
Allegheny	Butler	Clinton	Fayette	Juniata	McKean	Perry	Susquehanna	Wyoming
Armstrong	Cambria	Columbia	Forest	Lackawanna	Mercer	Philadelphia	Tioga	York
Beaver	Cameron	Crawford	Franklin	Lancaster	Mifflin	Pike	Union	
Bedford	Carbon	Cumberland	Fulton	Lawrence	Monroe	Potter	Venango	
Berks	Centre	Dauphin	Greene	Lebanon	Montgomery	Schuylkill	Warren	
Blair	Chester	Delaware	Huntingdon	Lehigh	Montour	Snyder	Washington	
Bradford	Clarion	Elk	Indiana	Luzerne	Northampton	Somerset	Wayne	

Note. Adapted from “PA Counties”, County Commissioners Association of Pennsylvania, Retrieved from <http://www.pacounties.org/PAsCounties/Pages/CountiesByClass.aspx>

All of the 67 counties included schools that offered AP courses. Information for the high schools in each county was collected. The following information appears on each county spreadsheet:

1. High school,
2. High school address,
3. County,
4. Grades,
5. Student population,
6. Percentage of free and reduced lunch,
7. Number of students enrolled in AP courses,

8. Number of students taking AP exams,
9. Number of exams taken,
10. Number of AP courses available,
11. AP courses offered,
12. Gatekeeping measures,
13. Weighted GPA percentage,
14. Mandatory AP testing,
15. Challenge Index,
16. 2nd Annual AP District Honor Roll, and
17. High School Uniform Resource Locator (URL) address.

As was the case for the previous section, the data used were collected by PDE for the 2010 – 2011 school year using the Pennsylvania Information Management System (PIMS). These data were then coded and analyzed by geographic location (county).

Thirty-nine of the 67 counties had 100% participation in the Advanced Placement Program by all traditional high schools within their boundaries, as represented in Table 11.

Table 11. *Pennsylvania Counties with 100% Participation in the AP Program*

COUNTY	NUMBER OF HIGH SCHOOLS	NUMBER OF ADVANCED PLACEMENT COURSES OFFERED
ARMSTRONG	5	15
BERKS	17	146
BUCKS	16	195
CAMERON	1	16
CARBON	5	10
CENTRE	5	33
CHESTER	22	244
CLINTON	2	10
COLUMBIA	6	28
DAUPHIN	11	90
DELAWARE	15	175
ELK	3	19
FAYETTE	5	45
FULTON	3	6
HUNTINGDON	4	7
JUNIATA	2	3

COUNTY	NUMBER OF HIGH SCHOOLS	NUMBER OF ADVANCED PLACEMENT COURSES OFFERED
LAWRENCE	7	28
LEBANON	6	39
LUZERNE	13	56
LYCOMING	8	47
MCKEAN	5	15
MERCER	12	51
MIFFLIN	2	16
MONTGOMERY	22	205
MONTOUR	1	12
NORTHAMPTON	9	79
NORTHUMBERLAND	6	32
PERRY	4	21
PHILADELPHIA	31	140
PIKE	2	26
SNYDER	2	14
SULLIVAN	1	5
UNION	2	17
VENANGO	4	8
WARREN	4	21
WASHINGTON	14	87
WAYNE	3	19
WYOMING	2	11
YORK	16	109

Note. Adapted from The Pennsylvania Department of Education information contained in personal email communication from A. Durante, Division of Data Quality, on September 6, 2011.

The number of high schools in each county represented ranged from a low of one high school in Cameron, Montour and Sullivan counties, offering a total of 17 AP courses, to a high of 31 high schools in Philadelphia County, offering 140 AP courses. Chester County had the most extensive AP participation, with 22 high schools offering 244 AP courses. Montgomery County was second; its 22 high schools offered 205 AP courses.

Percentages were compared for each county. In order to determine the relationship between the county SES level and the percentage of students enrolled in AP classes in the county, a percentage was calculated using the total number of students enrolled in AP and the total student population. Twenty-three of Pennsylvania's 67 counties have fewer than 10% of their student population enrolled in AP coursework. As Table 12 indicates, all of the 23 counties, except two, had a Free and Reduced Lunch Percentage within the range of 30% - 40%. Lackawanna, Wyoming and Juniata counties were the exception having 20.5%, 27% and 29.5% respectively.

Table 12. *Pennsylvania Counties with Lowest Participation Rate in the AP Program*

COUNTY	PERCENT OF STUDENTS ENROLLED IN AP COURSES	FREE AND REDUCED LUNCH PERCENTAGE
POTTER	.3%	45.6%
FORREST	2.0%	40.0%
SOMERSET	3.4%	36.2%
HUNTINGDON	3.9%	37.5%
CAMERON	4%	43%
SUSQUEHANNA	4%	35.1%
ARMSTRONG	4.3%	32.5%
CLARION	4.8%	34%
TIOGA	5.3%	43.8%
FULTON	5.7%	37.6%
BEDFORD	5.7%	37.8%
VENANGO	5.8%	41.5%
BLAIR	6.5%	36.8%
JUNIATA	7.0%	29.5%
WYOMING	7.5%	27.0%
LACKAWANNA	7.7%	20.5%
LUZERNE	8.1%	39.3%
MIFFLIN	8.2%	36.5%
CRAWFORD	8.4%	41.0%
JEFFERSON	8.6%	36.6%
WARREN	9.1%	38.0%
MCKEAN	9.7%	36.4%
CAMBRIA	9.9%	38.3%

Note. “Percent of students enrolled in AP courses” is calculated using the number of individual AP course enrollments, not an unduplicated count of students enrolled.

At first glance, the data would seem to indicate that there is a direct relationship between low AP enrollment and SES (using Free and Reduced Lunch percentages as an indicator). Upon closer

inspection of the 67 counties, many counties with higher AP involvement percentage rates have similar Free and Reduced lunch percentages, yet higher AP student involvement. Philadelphia County, which has the highest Free and Reduced Lunch percentage, 76.7%, of any county in Pennsylvania, maintains a 14.4% AP enrollment, despite the District’s requirement of mandatory testing. Table 13 highlights this significant difference in AP involvement. High schools are listed, in descending order, by Free and Reduced Lunch percentage.

Table 13. *Pennsylvania Counties with Low SES and Participation Rates Higher than 10% in the AP Program*

COUNTY	PERCENT OF STUDENTS ENROLLED IN AP COURSES	FREE AND REDUCED LUNCH PERCENTAGE
PHILADELPHIA	14.4%	76.7%
CLINTON	18.6%	46.0%
FAYETTE	19.7%	46.0%
GREENE	27.9%	41.4%
ERIE	13.4%	41.3%
CLEARFIELD	17.2%	40.5%
MERCER	15.1%	39.5%
INDIANA	14.2%	39.2%
ELK	18.9%	35.3%

Note. “Percent of students enrolled in AP courses” is calculated using the number of individual AP course enrollments, not an unduplicated count of students enrolled.

Of the counties listed above, Greene County has the highest AP student enrollment percentage, 27.9% of their student population, despite having an average 41.4% Free and Reduced Lunch rate.

On the opposite end of the AP student enrollment spectrum, beginning with Chester County, Table 14 lists the counties with the highest AP participation rate. The reader will note significantly lower Free and Reduced Lunch percentages.

Table 14. Pennsylvania Counties with Highest Participation Rates with Free and Reduced Lunch Percentage Noted

COUNTY	PERCENT OF STUDENTS ENROLLED IN AP COURSES	FREE AND REDUCED LUNCH PERCENTAGE
CHESTER	46.8%	13.3%
MONTGOMERY	41.4%	15.0%
BUCKS	36.9%	14.3%
UNION	35.3%	21%
BUTLER	34.3%	21.8%
ALLEGHENY	31.7%	37.8%
DELAWARE	29.8%	25.4%
PIKE	28.5%	34.0%
MONTOUR	28.1%	17.0%
GREENE	27.9%	41.4%
DAUPHIN	27.2%	30%
CENTRE	25.9%	25.4%
LEBANON	24.7%	24.1%
WASHINGTON	23.9%	29.4%
LANCASTER	23.2%	24.4%
SNYDER	22.5%	32.5%
CUMBERLAND	22.5%	14.7%

COUNTY	PERCENT OF STUDENTS ENROLLED IN AP COURSES	FREE AND REDUCED LUNCH PERCENTAGE
NORTHAMPTON	22.1%	16.2%
WESTMORELAND	21.6%	29.1%
CARBON	20.0%	33.4%

Note. “Percent of students enrolled in AP courses” is calculated using the number of individual AP course enrollments, not an unduplicated count of students enrolled.

With a remarkably high participation rate of 31.7% and a Free and Reduced Lunch rate of 37.8%, Allegheny County is the obvious outlier in Table 14. Upon closer inspection, three suburban school districts in Allegheny County accounted for the greatest percentage of test takers: Mount Lebanon had a 115% AP participation rate, North Allegheny - 102%, and Pine-Richland - 61% (Please note, this percentage is calculated using the number of individual AP course enrollments, not an unduplicated count of students enrolled). These three high schools accounted for 4, 322 of the students enrolled in AP coursework. The other 47 high schools in the County accounted for only 10, 513 of the AP students enrolled.

AP data regarding passage rates for individual high schools is not information that is found readily available in public documents. It is The College Board’s policy not to release information that could possibly be linked to individual students. The importance of this information lies in the inaccessibility of AP passage rate data to the general public by The College Board.

The 2nd AP District Honor Roll, published November 1, 2011, recognized 367 school districts across 43 states and Canada (CollegeBoard, 2011). Pennsylvania led all states in performance with 34 districts. The Honor Roll recognizes school districts for simultaneously increasing access to Advanced Placement coursework, while maintaining or increasing the

percentage of students earning a score of 3 or higher on AP exams. Inclusion on the Second Annual AP District Honor Roll is based on the following criteria:

- 1) Three years of AP data, from 2009 to 2011;
- 2) Increased participation in/access to AP by at least 4 percent in large districts, at least increased 6 percent in medium districts and at least 11 percent in small districts;
- 3) Steady or increasing numbers of exams taken by minority populations; and
- 4) Performance levels that have maintained or improved when comparing the percentage of students in 2011 with a score of 3 or higher to those in 2009, or the school has already attained a performance level in which more than 70% of the AP students are scoring a 3 or higher.

In Allegheny County, the second largest county in Pennsylvania, 7 school districts, or 20.5% of the 34 Pennsylvania districts listed, were recognized. The following school districts, followed by their Free and Reduced Lunch percentage, were honored: Avonworth (15%), North Allegheny (3%), Pine-Richland (6%), Riverview (37%), Shaler (20%), South Park (15%) and Upper Saint Clair (4%). Riverview School District, with 37% of its students qualifying for the Free and Reduced Lunch Program, was the only district honored possessing a percentage higher than 20%. Here it should be noted that the Pittsburgh Public Schools, the largest school district in Allegheny County, was not represented on the honor roll. No school districts in Philadelphia County, the second largest student population, with a Free and Reduced Lunch percentage of 76.7%, were listed.

Chester County has the largest percentage (46.8%) of their student population enrolled in AP coursework. They also have the lowest overall Free and Reduced Lunch Percentage rate (13.3%). Five of the County's 13 school districts, or 38.4%, were recognized on the honor roll.

The following school districts, followed by their Free and Reduced Lunch percentage, were honored: Avon Grove (9%), Coatesville (36%), Tredyeffrin-Easttown (2%), Downingtown (4%), West Chester Area School District (7%). Coatesville Area School District, with 36% of its students qualifying for the Free and Reduced Lunch Program, was the only district honored possessing a percentage higher than nine percent.

Washington County, with 23.9% of their students enrolled in AP coursework, had a Free and Reduced Lunch Percentage rate of 29.4%. Only one of the County's 14 schools, or 7.1%, was recognized. Peters Township High School, the obvious outlier, had 1006 of their 1450 students, or 69.3% of their population, enrolled in AP coursework. It should be noted that the Free and Reduced Lunch Percentage rate is 3%, the lowest rate of any high school in Washington County. Peters Township High School students accounted for 40.6% of the County's students enrolled in AP courses.

As data were collected, gatekeeping measures were noted. The following measures were the most commonly noted:

1. Prerequisite courses
2. GPA in prerequisite courses
3. GPA qualifying criteria
4. Teacher recommendation
5. Summer reading and writing assignments
6. Guidance approval
7. AP application
8. Open to specific grade levels (Juniors, Seniors)
9. Interview with AP teacher

10. Achievement test scores: state, local, national
11. Subject specific entrance examinations
12. Parent permission signature page
13. Student signature page
14. Student essay
15. Permission of instructor
16. No Drop Policy
17. Department Chair approval
18. Attendance
19. Mandatory AP exam

Some Pennsylvania high schools had highly restrictive and unusual requirements that appeared on their websites. Mt. Lebanon required that all potential AP candidates submit to a screening process. Cheltenham High School in Montgomery County notes that students may enroll in AP classes by “invitation only”. Downingtown High School West Campus requires that students show potential on AP Predictor Data. Hollidaysburg Area Senior High School requires a “Written Readiness Screener Exam” be taken by all students who apply for AP coursework. Perhaps the most restrictive requirement was noted at Mt. Carmel Area Junior/Senior High School in Northumberland County: only students who are members of the National Honor Society are permitted to enroll in AP coursework. South Fayette High School is the only high school in the state to have an “Honors Academy” distinction that is noted on the diploma of any high school student that has taken at least five AP courses and the corresponding exam.

Mandatory AP testing was required by 99 high schools statewide, or approximately 15% of the traditional high schools in Pennsylvania. It was usual to find that high schools requiring

students to take the AP exam were those with low percentages of students qualifying for the Free and Reduced Lunch Program. For example, Allegheny County had six high schools in the County that required mandatory testing: Elizabeth Forward, Montour, North Hills, Pine-Richland, Quaker Valley and South Fayette. Their Free and Reduced Lunch Percentages ranged from a high of 24% to 6%. Three counties: Delaware, Fayette and Philadelphia, were an exception. In Delaware County, two of the three high schools that required mandatory AP exams: Academy Park and Chichester had Free and Reduced Lunch Percentages of 59% and 40%, respectively. In Fayette County, the two high schools that required mandatory AP exams: Albert Gallatin and Frazier had Free and Reduced Lunch percentages of 60% and 41%, respectively. Philadelphia County requires 100% of students enrolled in AP classes in all 32 of its high schools to take the corresponding exam. The County Free and Reduced Lunch percentage is 76.7%.

Another theme that emerged during the collection of data, in relation to AP coursework and was subsequently used as a data collection category, was the effect of successful AP coursework on student GPA. In all but 2 high schools in Pennsylvania reporting grade weighting information on their websites, Greensburg Salem High School in Westmoreland County and Strath Haven High School in Delaware County, AP grades were weighted higher than any other coursework (i.e., honors, CHS, concurrent enrollment). It is not unusual for highly motivated and dedicated students to enroll in Advanced Placement courses to boost their grade point average (GPA), often ignoring the AP exam. Mandatory AP testing, a theme discussed above, is one way to discourage students from this.

Weighting methods varied from school to school, although similarities were often found by county. Multipliers were a common method used to weight Advanced Placement coursework

grades. The following multipliers were used in high schools across the state: 1.05, 1.06, 1.07, 1.08, 1.1, 1.15, 1.2, 1.25, 1.3, 1.35, 1.4, and a high of 1.5 (found only at Mt. Union Area Senior High School in Huntingdon County). The most common weighting was the use of an additional point added to the grade of “C” or above; however, there were also districts that awarded an extra point for a grade of “D”.

For as many different multipliers as were found statewide, conditional grade weighting was almost as prevalent. Bald Eagle High School, Centre County, and Ringgold High School, Washington County, required students to take the AP exam in order to have the AP designation appear on their transcript. Exeter Township Senior High School in Berks County used a 1.1 multiplier if AP exams were taken and a 1.05 if they were not. Cumberland Valley High School in Cumberland County used a 1.13 multiplier if AP exams were taken and a 1.125 if they were not. Schuylkill Haven High School, Schuylkill County, used a 1.33 multiplier for students who achieved grades of “A” or “B”. At Downingtown High School West Campus and Downingtown High School East Campus, Chester County, students must take the AP exam to receive the additional add on point. Pennsbury High School, Bucks County, added one point for grades of “A” or “B” only. In Lehigh County at Dieruff High School, where AP testing is mandatory and paid for by the District, a weighted grade is tied to the student’s AP exam score. Students who score a 3 or above on the AP exam receive a .4 weighting; students who do not score a 3 or above receive a .3 weighting.

In Warren and Monroe counties, a countywide grade weighting pattern can be seen. In Warren County, students in all four high schools received a 10 point add on with grades of “C” or higher. In Monroe County, four of the County’s six high schools tied grade weighting to AP course grades. Pocono Mountain East High School and Pocono Mountain West High School

have an add on of 4 percentage points with a grade of 76% or better. Stroudsburg High School has an add on of 7 points with a grade of 80% or better. Pleasant Valley High School, although not tying weight to grades, adds an amazing 9 points to AP grades.

After reviewing the wide variety and complexity of grade weighting processes across the state of Pennsylvania, the effect on college and university admissions policies became evident and was explored below in the discussion of question two.

4.2 WHAT ACCEPTANCE POLICIES AND REQUIREMENTS ARE IN PLACE IN PENNSYLVANIA INSTITUTIONS OF HIGHER LEARNING REGARDING THE GRANTING OF AP CREDITS?

The list of Pennsylvania institutions of higher learning used in the collection of data came from the Pennsylvania Department of Education website. Colleges and universities were arranged according to the following classifications:

- State-Related Universities
- State Owned Colleges and Universities
- Private Colleges and Universities
- Private Liberal Arts Colleges
- Two-Year Community Colleges

Data considered were:

- Number of AP examinations for which credit is given
- AP Score accepted
- Conditions, and

- Exceptions.

4.2.1 State-Related Universities

State-related universities, dominated by The University of Pittsburgh and The Pennsylvania State University and their branch campuses, accept different numbers of AP examinations. The University of Pittsburgh, and its branches, accept 35 different examinations and The Pennsylvania State University, and its branches, accept 37 examinations. Both The University of Pittsburgh and The Pennsylvania State University give credit for AP exam scores of 4 and 5 (a score of 3 is accepted in Art, Music, Foreign Languages and Chemistry at The University of Pittsburgh and The Pennsylvania State University). This is contrary to The College Board's publication of 3 as a passing score. Temple University accepts 33 different examinations. Temple requires a minimum score of 4 in Art History, Chemistry, English (Language and Literature), Political Science (Comparative Government and U.S. Government), History (American, European and World), Latin (Virgil and Literature), and Physics. All other AP exams are accepted with a minimum score of 3.

All state-related universities require an official submission of AP exam scores directly from The College Board to the university admissions office. With a passing score, as stipulated by the individual university, credit or a waiver may be earned. Temple University specifies that AP credit be used only in General Education areas.

It should be noted that no information concerning the Advanced Placement Exam was available on the Lincoln University website.

4.2.2 State Owned Colleges and Universities

Similar to data reported on state related universities, state owned colleges and universities accept different numbers of AP examinations for credit. Bloomsburg University of Pennsylvania, Edinboro University of Pennsylvania, West Chester University of Pennsylvania and Indiana University of Pennsylvania accept 30 different AP exams. Clarion University of Pennsylvania and Lockhaven University of Pennsylvania currently accept 32 exams, although the Lockhaven University website notes that additional exams maybe accepted via contact with the admissions office. Shippensburg University of Pennsylvania and Slippery Rock University of Pennsylvania accept 35 exams. Five state owned universities list no exceptions to AP exam acceptance: California University of Pennsylvania, Cheyney University of Pennsylvania, East Stroudsburg University of Pennsylvania, Kutztown University of Pennsylvania and Mansfield University of Pennsylvania.

Millersville University of Pennsylvania, although listing no exceptions added a highly restrictive notation that the number of AP credits granted depends on the student's academic major, the AP subject area and also departmental recommendation. Mansfield University of Pennsylvania limits its prospective students to no more than 12 credits from AP coursework applying toward graduation requirements. All state owned colleges and universities accept student scores of 3, 4, and 5.

4.2.3 Private Colleges and Universities

Similar to data reported on state owned colleges and universities, private colleges and universities accept differing numbers of AP examinations for credit. Thirty-three of the 55 colleges and universities investigated, or 60%, reported no information regarding the number of AP examinations accepted. Twenty-two of Pennsylvania’s private colleges and universities, or 40%, noted restrictions in the number of AP exams accepted. Table 16 illustrates the differences listed from least to greatest.

Table 15. *AP exams accepted by Pennsylvania’s Private Colleges and Universities*

COLLEGE OR UNIVERSITY	NUMBER OF AP EXAMS ACCEPTED
MOORE COLLEGE OF ART AND DESIGN	4
BRYN ATHEN COLLEGE	22
DESALES UNIVERSITY	25
LEHIGH UNIVERSITY	25
SAINT FRANCIS UNIVERSITY	25
GANNON UNIVERSITY	27
UNIVERSITY OF PENNSYLVANIA	28
DUQUESNE UNIVERSITY	29
VILLANOVA UNIVERSITY	29

WILKES UNIVERSITY	29
YORK COLLEGE OF PENNSYLVANIA	29
SAINT JOSEPH'S UNIVERSITY	30
SUSQUEHANNA UNIVERSITY	30
CENTRAL PENNSYLVANIA COLLEGE	31
SETON HILL UNIVERSITY	31
UNIVERSITY OF THE SCIENCES IN PHILADELPHIA	31
UNIVERSITY OF SCRANTON	34
CABRINI COLLEGE	35
WIDENER UNIVERSITY	35
CARNEGIE MELLON UNIVERSITY	36
MORAVIAN COLLEGE	36
DREXEL UNIVERSITY	42

Special conditions and limitations are listed by most of Pennsylvania's private colleges and universities. DeSales University stipulates that only scores from the first AP exam will be accepted; repeated exam scores will not be used. Central Pennsylvania College will grant only 12 credits for AP exams. Chestnut Hill College will grant 15 credits. Students with an AP score of 3 may earn credit in general education courses. For scores of 4 or 5, credit will be given in student's major. Easton University, on the opposite end of the spectrum, will accept 60 credits.

Saint Francis University, which will accept 25 AP exam credits stipulates that generally a score of 3 will waive a course, a score of 4 of 5 the university will grant credit.

Twenty-seven of the private colleges and universities, or nearly 50%, accept AP exam scores of 3, 4 and 5, although six of the 27 make note of exceptions. Seventeen of the private colleges and universities, or 30.9%, reported only accepting the more rigorous scores of 4 and 5; however, three of these 17 make note of exceptions. Duquesne University mentions that Acceptable AP exams scores are subject to change at any time.

4.2.4 Private Liberal Arts Colleges

Comparable to data reported on private colleges and universities, private liberal arts colleges accept differing numbers of AP examinations for credit. Fifteen of the 29 colleges investigated, or 51.7%, reported information regarding the number of AP examinations accepted. Table 17 illustrates the differences listed from least number of AP exams accepted to greatest.

Table 16. *AP exams accepted by Pennsylvania's Private Liberal Arts Colleges*

COLLEGE	NUMBER OF AP EXAMS ACCEPTED
GENEVA COLLEGE	24
KING'S COLLEGE	24
MUHLENBURG COLLEGE	26
CEDAR CREST COLLEGE	27
SWATHMORE COLLEGE	28
WESTMINSTER COLLEGE	29
BRYN MAWR COLLEGE	31
LAFAYETTE COLLEGE	32
BUCKNELL COLLEGE	33
LEBANON COLLEGE	33
LYCOMING COLLEGE	33
URSINUS COLLEGE	34
MESSIAH COLLEGE	35
FRANKLIN & MARSHALL	37
GROVE CITY COLLEGE	37

Six of the 29 colleges, or 20.6%, report accepting scores of 3, 4, and 5 for credit. The other 23 accept scores of 4 or 5, only. Allbright College is unusual and reports awarding advanced placement for a score of 3 and General Studies curriculum credit for a score of 4 or 5. Bryn Mawr College's Advanced Placement policy is the most restrictive of the private liberal

colleges. The college allows a maximum of 32 credits and stipulates that the credits earned may not be applied to general education requirements. Further restrictions in Biology, Economics and Physics also apply.

4.2.5 Two-Year Community Colleges

Similar to data reported on state private liberal arts colleges, two-year community colleges accept differing numbers of AP examinations for credit. Compared with the information found on college and university websites, little information regarding AP acceptance policies was found on two-year community college websites. Only six of the 21 community colleges investigated, or 28.5%, reported information regarding the number of AP examinations accepted. HACC, Central Pennsylvania's Community College, and its four branches accept 23 AP examinations. Lehigh Carbon Community College accepts 14 AP exams. Again, only six two-year community colleges, or 28.5%, noted restrictions in the number of AP exams accepted for credit. Delaware County Community College accepts the fewest credits, no more than 16 credits, from AP examinations. HACC, Central Pennsylvania's Community College, and its four branches accept no more than 30 credits from AP examinations. Butler Community College allows the most: 45 credits may be awarded through AP exams. All 10 of the 21 two-year community colleges that reported acceptable AP exam scores accepted scores of 3, 4 or 5.

Unfortunately, the information that informed this study was gathered solely by the review of public documents. This placed limitations on the amount of information gathered, particularly when dealing with cyber/charter high schools and two-year community colleges, as little

information regarding the Advanced Placement Program was available. A discussion of additional findings follows in Chapter 5.

5.0 DISCUSSION AND IMPLICATIONS

In 2005, at the National Governors' Conference, Bill Gates referred to high schools as "obsolete". Again, as recently as 2009, Dr. Vicki Phillips, former Pennsylvania Secretary of Education now serving as the Director of Education for U.S. Programs Bill and Melinda Gates Foundation, in testimony before the United States House of Representatives Education and Labor Committee about the crisis in American high schools stated that the crisis is "brutally simple: too few students are making strong academic gains during the high school years" (Phillips, 2009). In 2005, Pennsylvania identified the need for high school reform following the National Governors' Conference. Governor Rendell, along with his Secretary of Planning and Policy Donna Cooper, and a team of educators from PDE, developed and implemented a \$40 million high school reform plan, Project 720. One of the primary goals of Project 720 was to increase high school rigor, and many of the high schools funded by this grant used monies to expand Advanced Placement course offerings and to pay for AP testing.

As reported in the literature review, little information on the Advanced Placement Program for the state of Pennsylvania had been aggregated and reviewed. Through a thorough investigation of public documents related to the AP Program in Pennsylvania this researcher has attempted to create an accurate representation of the current program: where it is and the direction it may be headed. Here it should be noted that since this study focuses on public documents alone, and despite the detailed data collected, a complete study of the AP Program in

Pennsylvania was impossible, as data regarding AP exam passage rates, as collected by The College Board, were not publicly available. Invaluable comparisons as to the efficacy of individual high school AP programs were not possible to make. This researcher questions the reasoning behind restricting the availability of this valuable information.

With the end of Project 720 in 2010, which was used by some school districts as an AP incentive program, would the state's focus on high school rigor falter? The answer found in the 2nd Annual AP Honor Roll, published by The College Board, indicates that it has not. The Honor Roll uses a compilation of three years of AP data, from 2009-2011, which, as previously stated, rates school districts for increasing access to Advanced Placement coursework, while maintaining or increasing the percentage of students earning a score of 3 or higher on AP exams. Pennsylvania high schools lead the nation, with 34 qualifying school districts. New York and Massachusetts followed closely with 30 (CollegeBoard, 2011).

Nationally, in all but four states in the nation, more public high school students in the class of 2011 took and passed at least one Advanced Placement exam (18.1 percent up from 16.9 percent for graduates of the year before) (Adams, 2012). Yet, the report also shows that many students in the country who had academic potential to succeed in the rigor of AP coursework, didn't take exams, either by choice or because schools that they attended did not offer the courses.

In Pennsylvania, The 8th Annual AP Report to the Nation reports that the number of high school graduates taking AP exams rose from 25,561, in 2010, to 27,453, in 2011 (CollegeBoard, 2011). The number of Pennsylvania graduates taking and passing AP exams during the same years increased from 16,488 to 17,708. The number of graduates taking exams increased by 1,892, while the number of graduates taking and passing an AP exam reflected a more moderate

increase of 1,220. More good news for Pennsylvania is reported in the trends for success for low income students. In 2011, 7,645 exams were taken by low income graduates in the class of 2011. In 2011, 3,377 low income graduates had left high school having taken an AP exam. In 2010, that number was 2,031, reflecting an increase of 1,346 graduates. The number of low income graduates taking and passing AP exams during the same years increased from 777 in 2010, to 1,177 in 2011, reflecting an increase of 400 students, but a percentage of increase equal to 33.9%.

The investigation of cyber/charter high schools in Pennsylvania showed much public information lacking. All information regarding cyber/charter schools came from two types of sources: school websites and the PDE website. Many of the school websites were of little help. Few Curriculum Guides describing courses offered could be found; therefore, the majority of information regarding cyber/charter schools came from PDE. The cyber/charter schools in Chester County offered the greatest number of AP courses, with little or no relationship to their SES levels as determined by Free and Reduced Lunch percentages. However, geographic location may explain the attention to rigor, as Chester County traditional high schools had the greatest number of school districts listed on the 2nd Annual AP Honor roll in Pennsylvania. Only 2 of the 70 schools made note of gatekeeping measures on their websites.

In Philadelphia and Allegheny counties there also seemed to be no relationship between SES and involvement in the AP Program. In Philadelphia County, with the largest concentration of cyber/charter schools in the state, Community Academy of Philadelphia Cyber School offered the highest number of AP courses (10), with a Free and Reduced Lunch percentage of 48.1%. Allegheny County, with the second largest concentration of cyber/charter high schools, had their highest AP representation at Northside Urban Pathways Charter School, with 127 out of 200

students enrolled in AP coursework despite 88.7% of their students qualifying for the Free and Reduced Lunch Program.

Due to the Corbett Administration budget cuts to high schools across Pennsylvania, increased pressure may soon be placed on cyber/charter schools across the state requiring them to raise the bar and increase AP course offerings. Prior to the 2010 – 2011 school year, Pennsylvania school districts paid cyber/charter tuition in the amount of 70% of their average daily cost to educate traditional students, due to state reimbursements. However, this reimbursement has been eliminated and local school districts now pay 100%. As school funds dwindle and local school districts pay 100% of what it costs them to educate a traditional high school student, added burden and increased requirements may come to rest on cyber/charter schools. Equity in services and course offerings may become a requirement.

In traditional high schools in Pennsylvania, 39 counties out of 67 had AP course offerings in every high school within county boundaries. The pattern that revealed itself was that schools with smaller populations of students tend to offer fewer AP courses. This, most likely can be attributed to limited staffing and the ability to attract highly qualified teachers to smaller, usually less affluent, districts. The good news is that references were found regarding the availability of on-line AP coursework being made accessible to students in these smaller, and usually less affluent, districts. More good news appears in the 99 high schools, statewide, that require students enrolled in AP coursework to also take the corresponding AP exam. Philadelphia County with a Free and Reduced Lunch percentage of 76.7% requires this of all students. The county expects excellence and provides equity to its students.

The use of AP courses as a means to inflate grade point averages (GPA) by academically focused students was an interesting facet of this study. As previously noted, the weighting of AP

courses was higher than Honors, CHS and Dual Enrollment courses, and was found to be widely disparate. Many students focused on college acceptance attempt to take AP courses to boost their GPA with no intention of taking the AP exam. As a matter of equity this researcher wonders if The College Board should consider a policy change requiring all students enrolled in AP courses to take the corresponding exams.

As previously stated, the picture of AP in Pennsylvania is incomplete due to restrictions on the release of individual high school AP passage data. Without this information, which is not readily available on the Pennsylvania Department of Education (PDE) website, or through The College Board, the efficacy of individual high school AP programs is not possible to assess or compare.

With the dramatic cuts to public education in the Corbett Administration, this researcher believes that the Advanced Placement picture in Pennsylvania may distort rapidly. The deepest Corbett cuts have been to budgets for institutions of higher learning statewide. As previously stated in Chapter 4 of this study and documented in Appendix C of this dissertation, institutions of higher learning are currently very generous in their acceptance of AP credits. With these deep budget cuts, will Pennsylvania colleges and universities continue to be so willing, because of the financial constraints, to accept AP credits? With these budget cuts, there appears to be a growing need for a collaborative community between administrators and policymakers from Pennsylvania's high schools and institutions of higher learning. Working together a decline in rigor may be avoidable.

5.1 IMPLICATIONS FOR FUTURE RESEARCH

Due to the original premise for this study, which was to be an investigation of public documents, much relevant information was unavailable to this researcher. Detailed information was available on the Pennsylvania Department of Education's website. Available data on individual high schools included: AP courses offered, number of students enrolled in AP coursework, student population, and Free and Reduced Lunch percentage. A more complete portrait of Pennsylvania would be possible with the addition of individual high school information from The College Board, which is not publicly available.

Additionally, it is suggested that future research explore the obvious outliers, schools previously mentioned, such as Riverview and West Greene High School, that have higher AP involvement than high schools that are far more affluent. These schools need to be studied and emulated to insure future success. School culture in these successful high schools, with high SES and high AP participation, should be examined. In depth qualitative interviews might shed light on the systemic issues that impede success in schools where lower AP involvement is evident. For example, future research may benefit from asking school leaders, counselors, teachers and students what they feel are the barriers to high school reform in their district. A study of high schools of similar size, and similar SES, in the same county would be beneficial.

In Bucks County, two very similar high schools have very different AP offerings. Truman Senior High School, has a Free and Reduced Lunch enrollment of 47% and offers 5 AP courses, while Morrisville High School, with a slightly lower Free and Reduced Lunch enrollment, 41%, offers none. Similarly, in Butler County, Karns City High School with a student enrollment of 784, and a Free and Reduced Lunch rate of 35% offers no AP

coursework. While Moniteau High School with an enrollment of 773, and a Free and Reduced Lunch enrollment of 39%, offers 5 AP courses.

Finally, it is suggested that future research explore the effects that the Corbett Administration's budget cuts have on higher education AP acceptance policies. Funding cuts may have a direct effect on AP credits accepted by colleges, universities and community colleges due to the volume of tuition loss triggered by the continued acceptance of these credits.

With the end of federal stimulus funds and shrinking state and local tax revenue combined with high unemployment and the collapse of the housing market, nearly 84 percent of all public school districts expected to cut essential services in the 2011 – 2012 school year (Harvey, 2011 - 2012). These budget cuts will most certainly impact the Advanced Placement Program in Pennsylvania. During this tumultuous time in public education, many questions remain. It is the hope of this researcher, that through an increased focus on the study of the Advanced Placement Program in Pennsylvania, equity and excellence will be within the reach of all of our students. It is also this researchers hope that we will no longer see schools that promote policies that accept students into Advanced Placement courses by "Invitation only."

APPENDIX A

DATA COLLECTION RESEARCH PROCEDURES FOR SECONDARY SCHOOLS

1. Search each individual high school website for AP data:
 - A. High school name and address,
 - B. County,
 - C. Student population,
 - D. Percent of Free and Reduced Lunch students,
 - E. Number and type of AP courses offered,*
 - F. Number of students enrolled in AP courses,
 - G. Number of AP exams taken,
 - H. Gatekeeping measures,
 - I. GPA
 - J. Mandatory AP testing, and
 - K. Challenge Index rating.
2. If all data categories are not complete after searching district website, conduct a Google search using the search term “Advanced Placement” and the high school name. Search articles identified in the search results for pertinent data.

3. Place all AP information found in the appropriate categories on the Excel spreadsheet.
For any category for which no information is found, indicate with “not reported”.

REFERENCES

- Adams, C. (2012, February 9), *Eligible students missing out on AP*. Retrieved from <http://www.edweek.org/ew/articles/2012/02/08/21ap.h31.html>
- Adelman, C. (1999). *Answers in the tool box: Academic intensity, attendance patterns and Bachelor's Degree attainment*. Washington, DC: U. S. Department of Education.
- American Diploma Project. (2004). *Ready or not: Creating a high school diploma that counts*. Washington, DC: Achieve Inc.
- American Diploma Network: Pennsylvania's State Plan (n.d.). Retrieved from <http://www.achieve.org/files/PA-ADPplan.pdf>
- Andrews, H. (2003). *Progress in Advanced Placement and International Baccalaureate in SREB states*. Atlanta, GA: Southern Regional Education Board.
- AP International Recognition. (n.d.). Retrieved from <http://www.collegeboard.com/student/testing/ap/intad.html>
- AP Yearbook (2000). New York: The College Board.
- Apple, M.W. (1996). *Cultural politics and education*. New York: Columbia University.

- Arellano, A. R., & Padilla, A. M. (1996). Academic invulnerability among a select group of Latino university students. *Hispanic Journal of Behavioral Sciences*, 18, 485 – 508.
- Bernhole, A., Baenen, N., & Howell, T. (2000). *Advanced Placement exam results, 1998-1999. Measuring up.* (Report No. E&RR-00.21). Raleigh, NC: Department of Evaluation and Research. (ERIC Document Reproduction Service No. ED445090). Retrieved from ERIC database.
- Borland, J. H., & Wright, L.(1994). Identifying young, potentially gifted, economically disadvantaged students. *Gifted Child Quarterly*, 38, 164 -171.
- Bradt, S. (2006, February 23). *High School AP courses do not predict college success in science.* Harvard Gazette Archives. Retrieved from <http://www.news.harvard.edu/gazette/2006/02.23/05-ap.html>
- Brooks, D. (2005, September 25). The education gap. *The New York Times*, p. 11.
- Bush, J. (2009). *Education reform: What Indiana can learn from Florida.* Foundation for Excellence in Education. PowerPoint presented at Indiana Roundtable meeting on September 2, 2009.
- Callahan, C. M. (2003). *Advanced Placement and International Baccalaureate programs for talented students in American high schools: A focus on science and math* (Research Monograph 03267). Storrs, CT: National Research Center on the Gifted and Talented, University of Connecticut.

- Camara, Wayne. (2003). *College persistence, graduation and remediation*. College Board Research Notes (RN-19). New York, NY.
- Casserly, P.L. (1986) *Advanced Placement Revisited*. (College Board Report 86-6). New York, NY: College Entrance Examination Board.
- Cech, S.J. (2007, November 14). *Number of schools offering AP falls after first audit of courses*. Education Week.27 (12), 1-13. ERIC Document Reproduction Service No. EJ27530526) Retrieved from ERIC database.
- Central Committee of the School and College Study. (1952). *General education in school and college: A committee report by members of the faculties of Andover, Exeter, Lawrenceville, Harvard, Princeton, and Yale*. Cambridge, MA: Harvard University Press.
- Chevront, R. & Barbour, C. (2001, October 4). *Governor issues final National Commission on the High School Senior Year report*. Retrieved from http://www.e-archives.ky.gov/_govpatton/search/pressreleases/2001/syearreport.htm
- Chubb, J. & Moe, T. (1990). *Politics, markets, and America's schools*. Washington, D.C.: Brookings Institution.
- Chute, E. (2011, January 11). Rendell lauds PA's showing in education survey. Retrieved from <http://www.post-gazette.com/local/breaking/rendell-lauds-pas-showing-in-education-survey-1117163?p=0>
- Coleman, J.S. (1988). Social capital in the creation of human capital. *American Journal of Sociology*, 94, S95 – S120.

- CollegeBoard. (1997). *National summary reports 1997*. Retrieved from http://www.collegeboard.com/student/testing/ap/exgrd_sum/1997.html
- CollegeBoard. (2000a). AP Subjects. Retrieved from <http://www.collegeboard.org/ap/subjects.html>
- CollegeBoard (2000c). *Vertical Teams*. Retrieved from <http://www.collegeboard.org/ap/pre-ap/vertical.html>
- CollegeBoard. (2001). *Access to excellence: A report to the nation on the future of the Advanced Placement program*. Retrieved from <http://www.college-board.org/ap/index.html>
- CollegeBoard. (January 25, 2005). *Advanced Placement proves gateway to college success*. Retrieved from <http://www.collegeboard.com/press/article/0,,41022,00.html?print=true>
- CollegeBoard. (2005). *AP report to the nation*. Retrieved from http://www.collegeboard.com/about/news_info/ap/2005/
- CollegeBoard. (2006). *National summary reports 2006*. Retrieved from http://www.collegeboard.com/student/testing/ap/exgrd_sum/2006
- CollegeBoard. (2008). *The fourth annual AP report to the nation*. Retrieved from http://www.collegeboard.com/about/news_info/ap/2005/
- CollegeBoard. (2009). *Summary Report*. Retrieved from http://www.collegeboard.com/student/testing/ap/exgrd_sum/2007/html.

CollegeBoard. (2009b). *The fifth annual AP report to the nation*. Retrieved from http://collegeboard.com/html/aprtn/pdf/ap_report_to_the_nation.pdf

CollegeBoard Inspiring Minds. (2010). *The seventh annual AP report to the nation*. Retrieved from http://www.collegeboard.com/html/aprtn/pdf/ap_report_to_the_nation_pdf

CollegeBoard (2011, November 1). *AP District of the Year Awards: 2nd Annual AP District Honor Roll*. Retrieved from http://media.collegeboard.com/content/pdf/AP_2nd_Anual_Honor_Roll.pdf

College Board Inspiring Minds. (2011). *The eighthth annual AP report to the nation*. Retrieved from http://www.collegeboard.com/html/aprtn/pdf/ap_report_to_the_nation_pdf.

CollegeBoard Inspiring Minds. (n.d.) *A P scholar awards*. Retrieved from <http://www.collegeboard.com/student/testing/ap/scholarawards.html?print=true>

Cook, T, & Reichardt, C. (1979). *Qualitative and quantitative methods in evaluation research*. Beverly Hills, CA: Sage.

County Commissioners of Pennsylvania, *PA Counties*, Retrieved from <http://www.pacounties.org/PAsCounties/Pages/CountiesByClass.aspx>

Curry, W., MacDonald, W., & Morgan, R. (1999). The Advanced Placement Program: Access to excellence. *The Journal of Secondary Gifted Education*, 11, 17-23.

Daniel v. California (Super. Ct. Cal. 1999). Shriver Center. Retrieved from <http://www.povertylaw.org/poverty-law-library/case/52600/52606>

Demarest, E.J., Reisner, E.R., Anderson, L.M., Humphrey, D.C., Farquhar, E., and Stein, S.E. (1993). *Review of research on achieving the nation's readiness goal*. Washington DC: U.S. Department of Education.

DeVise, D. (March 25, 2008). *Nearly all area AP teachers get passing grades in audit*. Retrieved from <http://www.washingtonpost.com/wpdyn/content/article/2008/03/24/AR2008032403271.html>

DiYanni, R. (2002). The origins and development of the AP, the College Board's Advanced Placement Program: Part I, American beginnings and American successes. *International Schools Journal*, 22, 31-42.

DiYanni, R.(n.d.) *The history of the AP Program*, College Board, Retrieved from www.apcentral.collegeboard.com/apc/public/courses/21502.html

Dodd, B.G., Fitzpatrick, S.J., DeAyala, R.J., & Jennings, J.A. (2002). *An investigation of the validity of AP grades of 3 and a comparison of AP and non-AP student groups* (The College Board Research Report No. 2002-9). Retrieved from www.collegeboard.com/research/pdf/research.report20029v2_18667.pdf

Dougherty, C., Mellor, L., & Jian, S. (2005). *The relationship between Advanced Placement and college graduation*. Retrieved from www.just4kids.org

- Dougherty, C., Mellor, L., & Jian, S. (2006). *Orange juice or orange drink? Ensuring that "Advanced Placement Courses" live up to their labels.* Retrieved from www.just4kids.org
- Drew, C. (2011, January 9). Rethinking Advanced Placement. [Education Life]. *The New York Times*. pp.24-27.
- Elmore, R. (2004). *School reform from the inside out: Policy, practice, and performance.* Cambridge, MA: Harvard Education Press.
- Estacion, A., McMahon, T., & Quint, J. (2004). *Conducting classroom observations in first things first schools.* Retrieved from www.mdrc.org/publications/3901full.pdf
- Expanding the Advanced Placement incentive program. (February, 2006). Retrieved from www.ed.gov
- Feller, B. (February 8, 2005). *Student success rising at AP tests.* *Missourian*. Retrieved from <http://columbiamissourian.com/utown/print.php?ID=11965>
- Geiser, S. & Santelices, V. (2004). *The role of Advanced Placement and honors courses in college admissions.* University of California, Berkley: Center for Studies in Higher Education,
- Gewertz, C. (2006, December 20). Governor Rendell Touts Project 720 at Newport High School. *Education Week*, 26 (16), 20-26. (ERIC Document Reproduction Service No. EJ23722647) Retrieved from ERIC database.

Gewertz, C. (2008, March 12). Opening AP to All. *Education Week*, 27 (27), 23-25. (ERIC Document Reproduction Service No. EJ788532) Retrieved from ERIC database.

Gladwell, M. (2008). *Outliers: The story of success*. New York, NY: Little, Brown and Company.

Glesne, C. & Peshkin, A. (1999). *Becoming qualitative researchers: An introduction*. White Plains, NY: Longman.

Gonzalez, E. J., O'Connor, K. M., & Miles, J. A. (2001). *How well do Advanced Placements Students perform on the TIMSS Advanced Mathematics and Physics tests?* The International Study Center, Lynch School of Education: Boston College.

Governor Rendell announces recipients of High School Reform Grants, money will allow high school students to earn college credits, increase academic rigor, and receive enhanced counseling. (August 6, 2007). Retrieved from <http://www.state.pa.us/papower/cwp/view.asp?A=11&Q=466210>

Hargrove, L. Godin, D. & Dodd, B. (2008). *College outcomes comparisons by AP and non-AP high school experiences*. Retrieved from http://professionals.collegeboard.com/profdownload/pdf/08-1574_CollegeOutcomes.pdf

Harvey, J. (2011, December – 2012, February). Privatization: A Drain on Public Schools. *Educational Leadership*. Vol. 69 (4), 48-53. Retrieved from

[http://www.ascd.org/publications/educational-leadership/dec11/vol69/
num04/Privatization@-A-Drain-on-Public-Schools.aspx](http://www.ascd.org/publications/educational-leadership/dec11/vol69/num04/Privatization@-A-Drain-on-Public-Schools.aspx)

Holstead, M.S., Spradlin, T.E., McGillivray, M.E., & Buroughs, N. (Winter 2010). The Impact of Advanced Placement Incentive Programs. *Education Policy Brief*, 8(1), 1-12.

Indiana Department of Education. (n.d.) *Supporting Student Success: Indiana's Diploma Requirements*. Retrieved from http://www.doe.in.gov/core40/diploma_requirements.html

Jackson, Kirabo, C. (2007). Cornell University. A little now for a lot later: A look at a Texas Advanced Placement Incentive Program. *The Journal of Human Resources*. (45) 3. Retrieved from http://works.bepress.com/c_kirabo_jackson/l/

Jaschik, Scott. (2006, February 20). Advanced yes, placement no. *Inside Higher Ed*. Retrieved March 31, 2006, from <http://www.insidehighered.com/news/2006/02/20/ap>

Johnson, K. A. (2004, March 29). Expanding Opportunity for Low-Income High School Students: Pell Grants vs. Advanced Placement Classes. *Backgrounder*, No. 1742. Retrieved from <http://www.heritage.org/research/education/bg1742.cfm>

Keng, L., & Dodd, B. G. (2008). *A comparison of college performances of AP and non-AP student groups in 10 subject areas*. Princeton, NJ: The College Board.

Klein, A. (2007) *A Class Apart: Prodigies, Pressure, and Passion, Inside One of America's Best High Schools*. New York, NY: Simon & Schuster.

Klein, A. (2006, November 29). College Board Readies Plans for AP Audits. *Education Week*, 26 (13). (ERIC Document Reproduction Service No. EJ754009) Retrieved from ERIC database.

Klopfenstein, K. (2004). The Advanced Placement expansion of the 1990's: How did traditionally underserved students fare? *Education Policy Analysis Archives*, 12(68). Retrieved from <http://epaa.asu.edu/epaa/v12n68>

Klopfenstein, K. & Thomas, M. K. (2005). *The link between Advanced Placement experience and college success*. Retrieved from <http://www.utdallas.edu/research/tsp/pdfpapers/newspaper1.html>

Koch, W.R., Fitzpatrick, W.J., Triscari, R.S., Mahoney, S.S., & Cope, J.E. (1988). *The Advanced Placement Program: Student attitudes, academic performance, and institutional policies*. Austin, TX: The University of Texas at Austin, Measurement and Evaluation Center.

Lareau, A. (2003). *Unequal childhoods: Class, Race and Family Life*. Berkley, CA: University of California Press.

LeTendre, B. (1996). *Examination of the efficacy of synergistic systems in comparison to traditional math curriculum*. Retrieved from <http://www.pitsco.com/pdf/Joplinstudy.pdf>

Lewin, T. (January 8, 2006). The two faces of A.P. How Advanced Placement levels the playing field and enriches the curriculum. Or does it feed the admissions frenzy and hijack the curriculum? [Education Life]. *The New York Times*, pp. 24-28.

Lewin, T. (February 8, 2006). Testing plan is gaining high ratings nationwide. *The New York Times*. Retrieved from <http://www.nytimes.com/2006/02/08/education/08repor.html?ei=5070&en=79afd5cb68b9>

Lichten, W. (2007). *Equity and excellence in the College Board Advanced Placement Program*. Retrieved from <http://www.tcrecord.org/Content.asp?ContentID=12928>

Massachusetts Trial Court Law Libraries (March 30, 2011) 603 CMR: Department of Education. Retrieved from <http://www.lawlib.state.ma.us/source/maa/cmr/603cmr.html>

Matthews, J. (2002, August 7). Advanced Placement. *Education Week*. 68-72.

Matthews, J. (2004, December 23). *Advanced courses in high school may not mean success at college*. The Washington Post, p. A07. Retrieved from http://www.aaps.k12.mi.us/pioneer.wise/a.p._test_in_the_news

McElvey, G. (2009). *Maintaining global leadership: Improving student performance in math and science*. National Math and Science Initiative. Retrieved from <http://www.azbec.org/files/>

Medina, J. (2009, August 4). In program giving cash, more pass AP tests. *The New York Times*. Retrieved from <http://www.nytimes.com/2009/08/05/education/05exams.html>

- Merriam, S.B. (1988). *Case study research in education: A qualitative approach*. San Francisco, CA: Jossey-Bass.
- Mertens, D.M. (2005). *Research and evaluation in education and psychology: Integrating diversity with quantitative, qualitative, and mixed methods* (2nd ed.). Thousand Oaks, CA: Sage.
- Morgan, R. & Crone, C. (1993). (Statistical Report 93-210) *Advanced Placement examinees at the University of California: An examination of the freshman year courses and grades of examinees in Biology, Calculus and Chemistry*. Princeton, NJ: Educational Testing Service.
- Morgan, R., & Klaric, J. (2007). *AP Students in college: An analysis of five-year academic careers*. (Research Report No. 2007-4). New York, NY: The College Board.
- Morgan, R., & Maneckshana, B. (2000). *AP students in college: An investigation of their coursetaking patterns and college majors* (ETS Statistical Report No. 2000-09). Princeton, NJ: Educational Testing Service. Retrieved from http://www.doe.in.gov/opd/advpla/docs/IDOE_Summary_of_Research.dpdf
- Morgan, R. & Ramist, L. (1998). *Advanced Placement students in college: An investigation of course grades at 21 colleges*. (Statistical Report 98-13). Princeton, NJ: Educational Testing Service.
- National Association of Secondary School Principals. (2004). *Breaking ranks II: Strategies for leading high school reform*. Retrieved from <http://www.principals.org>

- National Commission on the High School Senior Year. (2001). *Raising our sights: No high school senior left behind*. Princeton, NJ: The Woodrow Wilson National Fellowship Foundation.
- National Governors Association Center for Best Practices. (n.d.). *Raising rigor, getting results: Lessons learned from AP expansion*. Retrieved from <http://www.nga.org>
- National High School Alliance. (October, 2006). *Increasing academic rigor in high schools: Stakeholder perspectives*. Washington, DC: The Institute for Educational Leadership.
- Niederberger, M. (2010, October 21). Advocacy groups sue McKeesport Area schools. *The Pittsburgh Post-Gazette*, p. S-3.
- No Child Left Behind Act, P.L. 107-110, Section 1701-1706. Retrieved from <http://www.ed.gov/policy/elsec/leg/esea02/pg14.html>
- No Child Left Behind Act, P.L. 107-110, Section 1702 (9). Retrieved from <http://www.ed.gov/policy/elsec/leg/esea02/pg14.html>
- Nugent, S. A., & Karnes, F.A. (Winter 2002). The Advanced Placement Program and the International Baccalaureate Programme: A history and update, *Gifted Child Today*, 25 (1). 30 – 39.
- Paul, J.L. (2005). *Introduction to the philosophies of research and criticism in education and the social sciences*. Upper Saddle River, NJ: Pearson.
- Patton, M. (1980). *Qualitative evaluation methods* (2nd ed.). Beverly Hills: SAGE Publications.

Paige, R., & Marcus, K.L. (2004). *Achieving diversity: Race-neutral alternatives in American education*. Washington, DC: U.S. Department of Education, Office for Civil Rights.

Pennsylvania Department of Education, *Data and Statistics*, Retrieved from http://www.education.state.pa.us/portal/server.pt/community/data_and_statistics/7202

Phillips, V. (2009). *The Crisis in American High Schools*. Hearing before the United States House of Representatives Education and Labor Committee.

Powell, A.G. (1993). Student incentives and academic standards: Independent Schools as a coherent system, S.H.Fuhrman (Ed.), In *Designing Coherent Education Policy*. (pp. 141-179)San Francisco, CA: Jossey-Bass.

Project 720 2007 – 2008 site visit report: A project of the Pennsylvania Department of Education. (2008). Philadelphia, PA: Next Step Associates.

PSEA. (October 2005). High school change in Pennsylvania. *Emerging Issues in Education*. Harrisburg, PA: Education Services Division.

Ranking America's High Schools. (n.d.) *The Washington Post*. Retrieved from <http://apps.washingtonpost.com/highschoolchallenge/schools/2011/list/pennsylvania-schools/>

Rewarding Achievement. (n.d.). Retrieved from <http://reachnyc.org/FAQs.htm>

Ridenhour, N. V. & Siebert, E.D. (October, 1997). An opportunity for cooperation between high school and college/university faculty. *Journal of College Science Teaching*. Retrieved from <http://www.accessexcellence.org/TC/AP/coop.html>

- Rondinelli, B. (2008, October). *Project-based learning*. Symposium Conducted at the meeting of the University of Pittsburgh Advanced Leadership Academy, Pittsburgh, Pennsylvania.
- Rose, H. & Betts, J.R. (2001). *Math matters: The links between high school curriculum, college graduation, and earnings*. San Francisco, CA: Public Policy Institute of California.
- Rotherham, A.J. & Mead, S. (February, 2006). Challenged Index: Why Newsweek's list of America's 100 best high schools doesn't make the grade. *Education Sector*. Retrieved from <http://www.educationsector.org>
- Rothschild, E. (1995). Aspiration, performance, reward: The Advanced Placement program at 40. *College Board Review*, 176-177, 24-32, New York: The College Board.
- Schwandt, T. (1989). Recapturing moral discourse in evaluation. *Educational Researcher*, 18, 11-16.
- Standard and Poor's. (2004.). *AP scores and participation rates in 2004*. Retrieved from <http://www.ses.standardandpoors.com>
- Tai, R. (2008, Summer). Posing tougher questions about the Advanced Placement Program. *Liberal Education*. 38-43.
- Taylor, S. & Bogdan, R. (1984). *Intorduction to qualitative research methods: The search for meaning*. New York: John Wiley and Sons.
- Thomas B. Fordham Institute. (2009). *Growing pains in the Advanced Placement Program: Do tough trade-offs lie ahead?* Retrieved from http://edexcellence.net/index.cfm/news_advanced-placement-program-study

Trochim, W.. (October 20, 2006). *Research methods knowledge base*. Retrieved from <http://www.socialresearchmethods.net/kb/>

U.S. Department of Education Press Releases. (1998). *U.S. Education Department to provide state grants to pay Advanced Placement test fees for low-income students*. Retrieved from [http://www.ed.gov/Press Releases/05-1998/appr.html](http://www.ed.gov/Press_Releases/05-1998/appr.html)

U.S. Department of Education Press Releases. (2001). *Education Department supports Advanced Placement courses for low-income student with award that pays test fees*. Retrieved from [http://www.ed.gov/Press Releases/2001/10/10012001b.html](http://www.ed.gov/Press_Releases/2001/10/10012001b.html)

U.S. Department of Education. (2008). *Advanced Placement incentive program grants*. Retrieved from <http://www.ed.gov/programs/apincent/index.html>

Waits, T., Setzer, J.C., Lewis, L., & Greene, B. (2005). *Dual credit and exam-based courses in U.S. public high schools: 2002-03* (NCES No. 2005-009). Washington, DC: National Center for Education Statistics.

Wakelyn, D. (2009) *Raising rigor, getting results: Lessons learned from AP expansion*. Washington, DC: NGA Center for Best Practices.

White House Press Release. (2005). *No Child Left Behind: High quality, high school initiatives* [Electronic Version]. Retrieved from <http://www.whitehouse.gov/news/releases/2005/01/20050112-3.html>

Willingham, W.W., & Morris, M. (1986). *Four years later: A longitudinal study of Advanced Placement students in college*. (College Board Report No. 86-2). New York: The College Board.

Yin, R. K. (1989). *Case Study research: Design and research*. Newbury Park, NJ: Sage Publications.

Zori, S. (11 November, 2011). *AP Data for Allegheny County, 2011*. Symposium Conducted at the Allegheny Intermediate Unit 3 Curriculum and Instruction Development Meeting.