

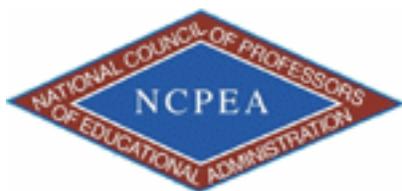
THE RIGOR MORTIS OF EDUCATION: RIGOR IS REQUIRED IN A DYING EDUCATIONAL SYSTEM*

Jason Mixon
Jerry Stuart

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Abstract

In an effort to answer the “Educational Call to Arms”, our national public schools have turned to Advanced Placement (AP) courses as the predominate vehicle used to address the lack of academic rigor in our public high schools. Advanced Placement is believed by many to provide students with the rigor and work ethic necessary to participate and succeed in obtaining the education necessary to bring the United States back to the forefront of the world dominance in economy, state-of-the-art technology, and education. Examining contemporary research literature on Advanced Placement and College Graduation variables, this review of literature exposed two common themes that consistently appeared throughout multiple sources. The lack of rigor within the national educational system and the achievement gap among minorities and low-socioeconomic students materialized as the missing ingredient within our public schools.



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1 Introduction

In the latter part of the twentieth century, the United States led the way in technological advancements and a strong economy. As we entered the twenty first century, the United States was forced into a globalized economy that is centered on state-of-the-art technology. As we enjoyed our successes of the twentieth century, we did not see the need for improving the rigor of our national education system. “Other nations around the world—recognizing the importance of an educated work force for their future development, prosperity and security—are producing a growing number of college graduates with mathematics and science degrees, challenging the United States’ historic lead in these fields.” (Zinth & Douney, 2006).

As the gap continues to widen, many organizations have studied and made recommendations on what is necessary to reestablish our superiority. Overwhelmingly, the majority of research findings indicate that in order to reestablish superiority, rigor must be brought to a new level in our American high schools. A qualitative study by the Academic Pathways to Access and Student Success (APASS) project drew upon the results of a 50-state survey and proposed an implementation of nine academic pathways in the United States: (1) Advanced Placement (AP); (2) Bridge programs; (3) College Level Examination Programs (CLEP); (4) Distance learning/Virtual high schools and colleges (DL/VH); (5) Dual credit and dual enrollment; (6) GED programs that bridge to college; (7) International Baccalaureate (IB); (8) Early and Middle College High School (EMCHS); and (9) Tech Prep and College Tech Prep. (Kim, 2006).

Each time our country issues a “call to arms,” an educational reformation follows. As stated earlier, in the latter part of the twentieth century, the United States led the way in technological advancements and a strong economy. When President Kennedy issued the call to arms in a race to the moon and for mathematicians and scientist to lead the way, policymakers responded with the *Elementary and Secondary Education Act* (ESEA) of 1965. As we triumphed in the many battles that attempted to stop us from accomplishing President Kennedy’s call to arms, our country became complacent and obsessed with the cold war with the Soviet Union. Many economists, futurists, and think tanks sounded the call to arms to revamp our educational system. Again, policymakers responded in 1983 with *A Nation at Risk*. Although some improvements appeared, America, so obsessed with the cold war and our triumph over the Russians, America rested on our educational laurels and the other countries of the world took notice. As we entered into the 21st century, it was apparent to everyone through the loss of jobs, a souring economy, and the influx of a foreign educated workforce that our national educational system had only a faint heart beat. To revive this system, President George Walker Bush, Jr. and the nation’s policymakers once again sounded the call to arms with another educational reformation, *No Child Left Behind* (NCLB) in 2001. This federal mandate requires every state of the union to become proactive in assuring that a plan is in place to give every child a high quality education, that instruction will be rigorous and scientifically researched based, personnel will be highly trained and effective, and parents will be empowered to partner with schools in their child’s education.

In an effort to answer the call to arms, our national public schools have turned to Advanced Placement (AP) courses as the predominate vehicle used to address the lack of rigor within its curriculum and ability to prepare students for postsecondary work and the national job workforce.

AP enrollment and school participation is at an all-time high. According to the College Board (2006) over 15,000 high school students participated in AP programs in 2005. Andrews (2004) completed a study, *Progress in Advanced Placement and International Baccalaureate in SREB States; College Readiness Series for the Southern Regional Educational Board (SREB)*, paid for with a grant from the U.S. Department of Education. The public schools within SREB’s 16 membership states led the nation in offering AP programs, 74%, compared to 65% nationally. Since 1992, the number of students in SREB states taking the AP exams has more than doubled—from 98,860 students in 1992 to the 273,335 students in 2002. Even more impressive is the number of minority students taking AP courses in SREB states. African American students in SREB states accounted for nearly 60 percent of the African American students nationwide who took AP exams.

One should stop and ponder “why” the explosion? Could AP really be that good, is there a financial movement pushing AP, or could it be both? Byrd, Davis and Finn (2007) in a study called, *AP Advanced Placement and International Baccalaureate: Do They Deserve Gold Star Status?* stated that the AP and IB curricula and exams are certainly much better than nearly all of the states standards and exams that

these committees have reviewed in years past. Clearly, AP and IB set higher goals for students than those established by the states, and their assessments set a standard that states should aspire to for more, if not all, of their students.

To encourage the availability of AP, many local, state, and federal policy makers have made funds available to school districts. Texas Education Agency (TEA) produced a study featuring the dramatic increase in state funding for the Texas AP/IB Incentive Program in the 2000-2001 biennium. TEA noted that the funding available through federal and local incentive programs substantially increased the numbers of Texas high school students taking the AP and IB courses and examinations during the year. In addition, a study by Byrd, Davis and Finn (2007) noted that many astute policymakers - local, state, and federal; have signed-on to the AP and IB bandwagon and are looking to enlarge the opportunities for children to participate within these two programs. Last year alone, the U.S. Department of Education awarded thirty-three grants, totaling \$17 million, to increase low-income students' opportunities to actively participate in AP/IB courses and end-of-course exams. Not only have state and government policy makers chipped in, but the study also notes that philanthropists, who desire to assist our national public schools raise academic achievement, have contributed serious money to these programs, too. One such contributor, The National Math and Science Initiative, Inc. (NMSI) launched by Exxon Mobil, gave a \$16 million grant to help the College Board expand its EXCEerator program, designed to improve graduation and college readiness rates, particularly for low-income and minority students.

AP courses have become the predominate vehicle used to address the numerous research based calls to arms. It is believed by many to provide students with the rigor and work ethic necessary to participate and succeed in obtaining the education necessary to bring the United States back to the forefront of the world dominance in economy, state-of-the-art technology, and education.

2 Lack of Preparation in our High Schools

America's public schools have not risen to the challenges and expectations of equipping a diverse body of students to participate and experience success in the postsecondary educational system nor the national job market. As a result, America is no longer the leader of the twenty-first century in education, economy, and developers of state-of-the-art technologies (National Center on Education and the Economy, 2006).

In response to this trend, America's postsecondary educational institutions have become concerned with the academic quality, as well as the lack of work ethic, in the students they are receiving from the nation's public school system. Since students are not equipped for postsecondary work, postsecondary institutions are requiring them to participate in remediation classes to acquire the necessary skills and abilities to conceptualize and disseminate the content and concepts needed to master their field of study. In particular, Bahr (2004) reaffirms this point by stating that nearly one-quarter of first-time college freshman nationwide enrolled in remedial math courses. Remediation programs are becoming a necessity in postsecondary institutions, reaffirming that students are not being prepared at the national high school level. Returning the focus back to our national public schools, Byrd, Finn and Davis (2007) reminds us why we have these problems when they stated,

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"...our reviews of state standards have consistently shown that expectations for American primary and secondary students are typically weak and watered down. Worse, at the high school level, state standards have few teeth. Because fewer than half of U.S. states require high school students to complete exit exams or standardize end-of-course exams, schools may choose to follow their state's standards, or not." Because public schools have not embraced the use of scientifically research based instruction in a systematic approach, there is a push to improve high school standards. (p. 5).

In an effort to reverse this trend and to better prepare students of our national high schools, the Advanced Placement (AP) courses have risen as the top choice. Although there are many alternatives, the general

consensus is that AP provides the rigorous, conceptual development, and work ethic needed to meet today's postsecondary high expectations and standards (Kim, 2006).

3 Examining the Contemporary Research

After studying numerous action research projects and examining the data therein, there are some absolutes that come to the surface: (1) America is no longer the leader in education (Zinth and Douney, 2006), (2) more students than ever are being required to take postsecondary remediation classes before they can start work in their specified discipline (Bahr, 2004), (3) rigor is missing from our national educational system (Bahr, 2004; Kim, 2006), (4) Advanced Placement courses are currently the top choice among educators and researchers for restoring rigor to our national education system (Kim, 2006).

After assimilating the information, a couple constructs initiate the following questions:

1. Do students that took Advanced Placement (AP) in high school do better in their university course work than students that did not participate in Advanced Placement (AP) while in high school?
2. Does an achievement gap exist in the preparation of minority and low socio-economic students enrolled in Advanced Placement courses that lowers the percentage of postsecondary graduates?

In the Relationship between Advancement Placement and College Graduation, (Dougherty, Mellor, Jian, and National Center for Educational Accountability (NCEA), 2006) study, the focus was on the relationship between students who do and do not take AP courses and graduate from college. The research focused on: (1) Comparing the college graduation rates of AP and non-AP students, (2) Comparing the College graduation rates AP and non-AP students after controlling for student's demographics and prior achievement and the demographics of their high schools, and (3) examining the relationship between percent of students from a given high school graduating from college, and the schools percent of students in AP courses.

The Texas Higher Education Coordinating Board (2005) in partnership with Educational policy makers has set a goal to attract 500,000 additional minority students into Texas postsecondary by the year 2015. Adelman (1999) points out that the labor market will not be best served unless these students also graduate from postsecondary institutions. When students leave high school, their academic readiness for postsecondary education is recognized as a strong indicator in college completion rates.

This report concludes: (1) Students who take AP courses and pass the exams are more suited for postsecondary success, (2) Many postsecondary institutions have added AP participation and success as part of their admission process, and (3) Adding this new requirement has increased student participation in AP programs.

The methodology for the study is longitudinal, quantitative, cohort design. The research subjects consisted of 67,412 Texas eighth graders state wide. Eighth graders were selected in order to control for student's academic preparation prior to entering high school. The study tracked the eighth graders through their high school graduation in 1998 and continued to see how many would enroll in a Texas public college or university within twelve months of their high school graduation. By the spring of 2003 (that was the most recent year data was available for analysis) these students had had five years since high school graduation to graduate from college. The analysis focused on the odds that a student would graduate from a Texas public college or university with a bachelor's degree in five years.

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Texas data were used because of the ability to track students longitudinally over an extended number of years, and to match K-12 in higher education data using a common student identifier. We disaggregated students by ethnicity into African-American, Hispanic, White, and "Other" (Asian and Native American), and separately by income into low and non-low- income student groups, to look at the relationship of AP to college graduation separately for each group. (p.5)

In the school-wide analysis for Question Three, we limited ourselves to schools with at least 500 students over-all and a least 15 students in the student group in question (e.g., African-American students). This reduced the size of our overall student cohort to 54,556 students. (p.6)

In this research, “academic” AP courses and exams refers to English, Mathematics, Science, and Social Studies, on the premise that these areas are most likely to predict a student’s college readiness. Using this information, the students were divided into four groups; (1) Passed AP exam; students who scored a 3 or above on at least one academic AP exam, (2) Took AP Course, Did not Pass AP Exam; students who did not score a 3 or higher on any AP exam, (3) Took AP Course, not AP Exam; students who took one or more academic AP courses, but did not take the AP exam, (4) Took No AP Course or Exam; students who took no AP courses or Exams.

For school wide analysis, the percent of students who passed at least one AP exam was defined as “AP exam passing rate” and referred to the entire student *population* rate of those who passed one or more AP exam. This distinguishes it from the “AP exam taker” which refers to the percent of AP exam takers who passed at least one exam. Thus, the first term measures the entire student *population* while the second refers only to *exam takers*.

The table below addresses research Question One: Do students in advance placement graduate from college at higher rates than non-AP students? These differences are based on the percentages shown, for example, the college graduation rate for low income AP passer was 39% higher (46% vs 7%) than the graduation rate for low income students who took no AP course or exam.

Five-Year College Graduation Rates in Texas Public Colleges and Universities

Student Group	Graduating and Difference Percentages	Passed AP Exam	Took, Did not Pass AP Exam	Took AP Course, Not AP Exam	Took No AP Course or Exam
African-American	% Graduating	53%	37%	30%	10%
-	% Difference	43%	26%	20%	-
Hispanic	% Graduating	54%	29%	23%	8%
-	% Difference	45%	21%	15%	-
White	% Graduating	65%	47%	41%	21%
-	% Difference	33%	22%	20%	-
Low Income	% Graduating	46%	27%	21%	7%
-	% Difference	26%	17%	12%	-
Non Low-Income	% Graduating	66%	47%	41%	21%
-	% Difference	34%	23%	19%	-
<i>continued on next page</i>					

Total	% Graduating	64%	42%	37%	17%
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Table 1

NOTE: Apparent discrepancies are due to the rounding of numbers

Table 2 below addresses research Question Two: Do students in Advanced Placement graduate from college at higher rates than non-AP students, controlling for the students' observed characteristics and the characteristics of their school?

Using the hierarchical linear modeling (HLM) regression approach, an alternative approach was calculated upon the same cohort, except now the variables were added, i.e. 8th grade mathematics score, economically disadvantaged (free and reduced price lunch) status, and the average test scores and percent economically disadvantage students in the student's school.

Table 2 shows the differences in predicted college graduation rates that emerged from this model. For example, the 39 percentage point advantage of low-income AP exam passers shown in Table 1 drops to 26 percentage points when differences in prior student academic achievement, school poverty rates, and other variables are taken into account.

Increase in Probability of College Graduation Compared with Students Not Participating in Advanced Placement

Student Group	Passed AP Exam	Took, Did not Pass AP Exam	Took AP Course, Not Exam
African-American	28%	22%	16%
Hispanic	28%	12%	10%
White	33%	22%	20%
Low Income	26%	17%	12%
Non Low-Income	34%	23%	19%

Table 2

Looking at Table 3 below, Question Three: Do high schools with a higher percentage of students in Advanced Placement have higher college graduation rates of their students who attend college, controlling for the measured characteristics of those schools?

Table 3 was completed by using ordinary least squares (OLS) regression at the school level. It implies that if a school has 100 additional students passing AP exams from the school's cohort of low-income students, the school would expect to gain 32 additional college graduates from that same cohort.

School-Level Regression Coefficients for College Completion (Five-Year Graduation Rates)

Student Group	Percent Taking and Passing AP Exams	Percent Taking but not Passing AP Exams	Percent Taking AP Course but No Exam
<i>continued on next page</i>			

African-American	0.21	0.18 **	0.10
Hispanic	0.27 ***	0.01	0.00
White	0.19 ***	0.03	0.04
Low Income	0.32 ***	0.05	0.06 *
Non Low-Income	0.23 ***	0.00	0.05 *
***p<.01, **p<.05, *p<.10Control variables in the model include the school's percentage of low-income students, the district drop-out rate, the school's percentage of students in the same ethnic group (for the ethnic group regressions), the average eighth grade mathematics score of the students in the group in question, and the percent of the group in question taking at least four mathematics and four science courses. Schools are included that had at least 500 students and at least 15 students in the group enrolling in a Texas public college or university.			

Table 3

Table 3 shows a statistically significant relationship between AP exam passing and college graduation for all groups except African-Americans—few schools had more than 10% of low-income and minority students taking and passing AP exams. The lack of statistical significance of the result for African-American students is likely to have been affected by the fact that only 61 African-American students in the cohort passed at least one AP exam. Policy makers and educators want to know, “Are schools and districts improving their students’ future college graduation success by enrolling more of those students in advanced placement courses?” Tables 1-3 do not directly answer this question; however, the approach based on question 3 minimizes self-selection bias within the school. We believe that this approach comes closest to answering the question policy makers have about the impact on college graduation rates of including more students in AP. (p.11)

We believe that these results are consistent with the other indicators showing a major college preparation gap for low-income students. To improve their college readiness outcomes for those students, school districts need to approach “advanced placement” not as a special set of courses for their already well-prepared students, starting in the early grades and including disadvantaged students, to be able to do college-level work before they leave high school. (p.14)

Andrews (2004) completed a study, Progress in Advanced Placement and International Baccalaureate in SREB States; College Readiness Series for the Southern Regional Educational Board (SREB), paid for with a grant from the U.S. Department of Education. SREB states have enacted high educational goals for their membership; leading the nation in educational progress. “Goals for Education; Challenge to Lead” focuses on the rigor of the high school curriculum and promotes the mantra; “All recent high school graduates have solid academic preparation and are ready for postsecondary education and a career.” I will explore the active participation and achievement rate of students participating in the AP program.

SREB membership consist of 16 states, which are: Alabama, Arkansas, Delaware, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia and West Virginia. The public schools of the aforementioned states lead the country in the percentage of offering the AP program, 74%, compared to 65% nationally. Since 1992, the number of nationwide students taking AP exams has steadily increased. During this same time period, the number of students in SREB states has more than doubled—from 98,860 students in 1992 to the 273,335 students in 2002.

The findings also revealed that more minority students are taking AP courses in SREB states than before. The number of African American students who took AP exams in public schools increased from 9,004 in 1993 to 23,691 in 2002. African American students in SREB states accounted for nearly 60 percent of the African American students nationwide who took AP exams. There was an even more dramatic increase in the number of Hispanic students who took AP exams in SREB states—from 7,058 in 1993 to 34,676 in 2002. Hispanic students in SREB states accounted for a larger percentage of the nation’s Hispanic students who took AP exams in 2002 (39%) than in 1993 (29%). (p.4) As more students take AP courses, the passing rates

on the end-of-course exams typically decrease. In 2002, 54 percent of students in SREB states who took AP exams earned a 3 or higher – down from 60 percent of test-takers in 1992. Because colleges generally award credit for scores of 3 or higher, that score is considered to be “passing.” Maryland’s passing rate of 71 percent was the highest in the region and exceeded the national average by 10 percentage points. Delaware, Tennessee and Virginia also surpassed the national average. Even AP students who do not earn college credit by scoring 3 or higher on the exams are better-prepared for college courses than are students who did not take AP courses, according to the College Board.

Since 1997, AP and IB courses have continued to dominate alternative choices of rigorous curricula and do continue to receive national prestige and recognition for their rigorous curricula. Many postsecondary institutions award students college credit for meeting their required criteria on end-of-course exams. In SREB states, this trend of awarding credit, reported in the “Lead the Nation in Advanced Placement and International Baccalaureate Programs; Challenge to Lead,” Andrews (2004), has continued and accelerated from 2000 to 2006. In addition, more seniors in SREB states are taking one or more AP exams than seniors nationwide and all SREB states accelerated their growth of participation in AP exams during this same allotted time.

This 2007 update, not only confirms the finds of the 2004 research, but makes the following recommendations to continue the growth experienced from the 2004 report, “States Lead the Nation in Advanced Placement and International Baccalaureate Programs. Challenge to Lead.” Generalized recommendations include; (1) policymakers continue to monitor the participation and performance rates of all groups of students in AP programs, (2) set targets for increasing these rates, and (3) support student efforts to take AP courses and exams. To ensure that all students, especially those in underrepresented groups, have opportunities to succeed in a rigorous, college-preparatory high school curriculum, the following specific strategies are recommended:

(1) Make AP and/or IB courses available to every student in every school; (2) Offer every student access to more advanced courses through a state virtual school, at no cost to the student; (3) Pay student testing fees, especially for low-income families; (4) Provide funding to train teachers who are eligible to teach AP courses; (5) Give incentives for schools to expand AP and IB offerings; and (6) Award bonuses to teachers and schools whose students perform well on these exams. (p.7)

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(1) Make AP and/or IB courses available to every student in every school; (2) Offer every student access to more advanced courses through a state virtual school, at no cost to the student; (3) Pay student testing fees, especially for low-income families; (4) Provide funding to train teachers who are eligible to teach AP courses; (5) Give incentives for schools to expand AP and IB offerings; and (6) Award bonuses to teachers and schools whose students perform well on these exams. (p.7)

MCPS stated in their report that classes of high rigor are essential for their students to be successful in postsecondary life. One of the offerings of the research was a report on the effectiveness of AP courses. This report provides a descriptive examination of the results of AP exam takers in the 2003-2004 school year. The key research questions addressed and their findings are: (1) How many students took an AP exam and how has it changed over time? In 2000, 4,597 (12.5%) students took an AP exam and in 2004, 9,702 (22.7%) students participated in the AP exam process, an increase of more than 10% (2) How many students take multiple exams? Of the 9,702 students taking an AP exam in 2003-2004, 4,556 (47%) took only one exam. Of the remaining students 26.0% took two, 16.5% took three, 6.8% took four, and 3.8% took five or more. In addition, if we compare the graduating class of 2001 to the class of 2004, the mean number of AP exams taken by students who earned 3 or better, rose from 2.4 (class of 2001) to 2.8 for the class of 2004. (3) What AP exams do Montgomery Public School (MCPS) students take?

For the most popular AP exam in MCPS in 2003-04, English Language and composition, the number of exams taken increased from 1,019 in 1999-00 to 2,214 in 2003-04. The second most popular exam in 2003-04, Psychology, increased from 1,011 in 1999-00 to 2,016 in 2003-04. English Language-Composition and Psychology together represent 22.2% of all AP exams taken in MCPS in 2003-2004. They represent

11.6% and 10.6% respectively. The third most popular AP exam is World History. The addition of World History expanded students' opportunity to take an AP exam, because taking the course satisfies a graduation requirement. English Literature represents 9.5% of exam taking and U.S. Government has increased its representation from 3.4% of all exams taken in 1999-00 to 9.4% in 2003-04. Math Calculus BC (a full year of college calculus) has decreased from 6.9% to 5.0% of all exams taken. Math calculus AB (comparable to a semester of college calculus) continues to represent 3.9% of exams taken in 1999-00 through 2003-04. (p.10)

(4) How did students perform on the exams? In 2003-04, the mean score for all MCPS AP exams declined from 3.6 to 3.4, a mean still above the 3.0 college accepted pass level. According to the College Board in 2004, a score of 3 on an AP exam, "Qualifies the student to receive college credit or advanced placement." When looking at the number of students who scored at least one 3 on an AP exam, the findings indicate that student success nearly doubled, but the number of students (3,919) participating in 1999-2000 more than doubled in participation to a 7,673 in 2003-04. Even though single student scores increased, the percentage of students as a group receiving a 3 or higher decreased from 85.3% to 79.1%. Findings suggest that the percentage decrease is because of participation increase from students. (5) Do students who have not taken the course take the exam? To identify students who took AP exams but were not enrolled in the actual AP class, a transcript analysis was conducted. Only 1.6% of the student body not enrolled in any type of rigorous labeled classes took AP exams and 4.3% of students enrolled in alternative rigorous labeled classes participated in the AP exam process.

Advanced Placement and International Baccalaureate Examination Results in Texas, (2000) results showed,

Of course, not all AP examinees take AP courses, nor do all students who participate in advanced courses ultimately take AP examinations. The correspondence between AP examination participation and advanced course completion was examined for school years 1992-93 through 1999-00. Since 1995, over half of the Grade 9-12 Texas public school AP examinees each year have also completed at least one AP course. This trend has risen to 88.7 percent of AP examinees by 2000. In that same year, a total of 93.3 percent of 2000 AP examinees completed some type of TEA-defined advanced course.

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Of course, not all AP examinees take AP courses, nor do all students who participate in advanced courses ultimately take AP examinations. The correspondence between AP examination participation and advanced course completion was examined for school years 1992-93 through 1999-00. Since 1995, over half of the Grade 9-12 Texas public school AP examinees each year have also completed at least one AP course. This trend has risen to 88.7 percent of AP examinees by 2000. In that same year, a total of 93.3 percent of 2000 AP examinees completed some type of TEA-defined advanced course.

Considered from another perspective, nearly 50 percent (46.0%) of AP course completers in 2000 took an AP examination—reflecting a moderate increase from the 41.6 percent correspondence noted in 1993. Although other advanced course completers remain much less likely than AP course completers to take an AP examination, AP examination participation continues to increase among all advanced course completers and at a more rapid rate (from 12.2% in 1993 to 26.5% in 2000). Data show a dramatic increase in the correspondence between AP examination participation and AP course completion in the same subject area. ...Nearly three fourths (74.7%) of the AP examinations in 2000 were taken by students completing the corresponding AP subject course—a huge increase from 52.1 percent just the year before. In addition, a sizable percent of AP course completers in 2000 (39.0%) took the corresponding AP subject examinations.

... This holds true across almost all AP subjects. Among the three academic areas in which AP course completers did not outscore other examinees, only the Spanish Language examination performance shows a greater than 0.1 difference in mean score; examinees who completed the Spanish Language AP course earned a mean score of 3.69 on the examination, compared to a mean of 3.99 earned by other examinees. In addition Spanish Language is the only academic area in which a greater number of students took the examination without having taken the corresponding AP course. A possible explanation for these results lies in the fact that three fourths of AP Spanish Language examinees were Hispanic and, feasibly, could be native speakers

of Spanish. . .(p.13).

AP and IB courses and examinations appear to be means to many critical longer-term goals. Willingham and Morris (1986) identified the following patterns among AP examinees:

- Students who earned scores of 3, 4, or 5 on AP examinations tended to excel in college to a greater degree than students who did not take the examinations. Such students were more likely to maintain a B average their freshman year and were more likely to graduate with academic honors. . . .They were more often accepted to doctoral-level programs following undergraduate work than their non-AP peers.
- Students who earned more scores of 4 or 5 on their AP examinations tended to have high scores on a college admissions test and to graduate in the top 10 percent of their high school class. They also were more likely to graduate from college with top honors. Students who scored 1 or 2 on the AP examinations tended to do less well—for example they were less likely to be among the top performers in high school and were less likely to graduate from college with honors.
- AP examinees were more likely to take more coursework in the subject areas in which they were tested. In fact they were also two to five times more likely to major in a subject area in which they were tested than were college students in general. Thus, taking a particular AP subject examination may indicate a special interest in that academic area. (p. 25).

In conclusion, TEA (2001) stated that:

The most important criterion in assessing the benefits of the AP and IB programs is, simply, the experience itself: whether or not students are gaining subject-specific, college-level learning while still in high school. A large and equally important part of the experience is taking the AP and IB examinations, because scores from the examinations represent objective, external, standardized measurements of how well students are likely to perform in the same courses taken in college. The overall value of college-level learning opportunities offered through AP and IB programs results from a combination of multiple factors, including the quality and rigor of the advanced courses, the effectiveness of the teaching, and the availability of AP or IB courses and examinations to an ever-increasing number and diversity of able and motivated students. Ultimately, such higher-level learning should translate into a greater number of Texas high school graduates who are academically prepared, should they so choose, to successfully meet the challenges of the college and university experience. (p. 25)

In 2006, a research initiative was launched by the Academic Pathways to Access and Student Success (APASS) to identify and disseminate the various academic pathways the states were using to ensure students obtained the skills necessary to transition from high school to postsecondary life. The initiative was qualitative in nature, reviewing the findings from: a 50-state survey, an extensive research of the literature, and consultation with national experts. The data revealed that AP courses are the number one choice of states used in preparing students for postsecondary life.

Zinth and Dounay (2006) released a study that centered on America's rise and fall as leader in the world economy, technology, and education. In the twentieth century, America was enjoying great success, however, as the world entered the twenty-first century, America was being pushed into competing in an increasingly globalized, high-tech economy.

Other countries began to realize and highly promote individuals with quality mathematics and science degrees and to bring economic stability and other benefits on their nations and the regions in which these highly educated people lived and worked. The research warned that nations around the world—recognizing the importance of an educated workforce for their future development, prosperity and security—are producing a growing number of college graduates with mathematics and science degrees, challenging America's historic lead in these fields.

Acknowledging the challenge that lies ahead, numerous researchers, think-tanks, and groups of people began studying this crisis and looking for answers. Proposed actions commonly include boosting the number of America's students graduating with college degrees in mathematics and science. In order to accomplish this goal in the coming years, schools must address the needs of teachers and students now. So, the study

asked, “Which actions should policymakers implement first—those that seek to better prepare students, or those that prepare and recruit teachers?” The derived answer: both.

This report identifies the types of state policy activities most likely to positively impact teachers under the two categories: (1) Recruiting new science and mathematics teachers; and (2) Strengthening the skills of existing teachers. It identifies the types of state policy activities most likely to positively impact students under four categories: (1) Increasing the number of students who take AP (Advanced Placement) and IB (International Baccalaureate) science and mathematics courses; (2) Raising the minimum number of credits high school students need to complete in mathematics and science, and requiring students complete specific mathematics and science courses most likely to prepare them for postsecondary coursework; (3) Reducing the need for remediation at the postsecondary level; and (4) Establishing programs aimed at improving achievement by low-income and minority students.

The report, *Advanced Placement and International Baccalaureate: Do They Deserve Gold Star Status?* by Byrd, Davis and Finn in 2007, was authorized by their employer, Thomas B. Fordham Foundation & Institute. The existing purpose of the foundation is to find gold, curriculum gold. Finn and Davis (2007) stated,

“...our reviews of state standards have consistently shown that expectations for American primary and secondary students are typically weak and watered down. Worse, at the high school level, state standards have few teeth. Because fewer than half of U.S. states require high school students to complete exit exams or standardize end-of-course, schools may choose to follow their state’s standards, or not.” Because public schools have not embraced the use of scientifically research based instruction in a systematic approach, there is a push to improve high school standards. (p. 5).

3.4

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Philanthropists keen to raise academic achievement have given serious money to these programs, too. The National Math and Science Initiative, Inc. (NMSI) launched by Exxon Mobil, gave a \$16 million grant to help the College Board expand its EXCEerator program in Chicago, Washington, D.C., and Duval County, Florida. Designed to improve graduation and college readiness rates, particularly for low-income and minority students, EXCEerator is “aimed at dramatically increasing enrollment and success in advanced courses—especially Advanced Placement (AP) courses. (p.7)

The study became necessary because many high schools were implementing policies to increase the number of participants in their AP program because postsecondary institutions were using the AP exam scores as part of the admission process. The study focused on reviewing the curriculum, outlines, and exams for AP English Literature and Composition, AP U.S. History, AP Biology, and AP – AB Calculus’s. Each discipline was reviewed by a national panel who are considered to be experts in their field and veteran evaluators of state academic standards. The following criterion for review was used:

1. Content (60 percent of Grade)

3.5

a. Is the content properly chosen, and does it reflect a gold standard for what graduating high school students should know and be able to do in this content area? Do the materials provided to the teachers by the examining body provide sufficient guidance about the content knowledge and skills required to do well on the exam?

b. Does the exam align to the content of the course guidelines/curriculum set for by the examining body? If not, are the content and performance expectations of the exam better or worse than the course guidelines/curriculum at setting a “gold standard” for exiting high school seniors? Why or why not?

2. Rigor (30 percent of the grade)

A course could have good content (criterion 1, above), and that content could be described in a clear, organized way (criterion 3, below), yet the course overall might still not have an appropriate level of intellectual challenge for exiting high school seniors (as reflected in the exam as well as in the course outlines),. Overall, how rigorous is the course?

3. Clarity (10 percent of grade)

Are the materials understandable, well-organized, and teacher friendly? (p. 12)

In their findings, each panel listed the strengths and weakness of the four disciplines and did a correlation of how the AP and IB courses, outlines, and exams were similar and different. The recommendations were made to both organizations on improvements that would be beneficial to students and the processes involved in teaching the courses. An analysis of the conclusion rendered that both AP and IB academic expectations for these courses are decently expressed, end-of-course exams are well aligned with the curriculum, and the grading standards are clearly described and accessible to teachers and students. The AP and IB curricula and exams are certainly much better than nearly all of the states standards and exams that these committees have reviewed in years past. Clearly, AP and IB set higher goals for students than those established by the states, and their assessments set a standard that states should aspire to for more, if not all, of their students. Although the report warned state and federal policymakers of accepting this as a 24 carat gold program, it did acknowledge that is was by far the best program when compared to any state-mandated standards or curricula available throughout the United States school systems. For that, it deserves the gold star.

4 Common Themes of Research

After reviewing the literature, there are two common themes that appeared and reappeared throughout; the lack of rigor within the national educational system which has caused a deficiency of college graduates to fulfill the needs of our nations’ workforce and the achievement gap among minorities and low-economic students that limits the diversity of the postsecondary experience and the job force.

5 Summary

Based on the review of literature, during the past forty years, three major educational reformations have been enacted by policy makers when a “call to arms” was announced. All too often, this call of urgency comes at a time when our national educational system is not meeting the needs of our national economy.

In order to prepare a proactive workforce that can return America to her dominance, the curriculum and processes used to educate each student must change. There is proof that rigor and our inept ability to prepare America’s minorities and low-income students is the missing ingredient. Is Advanced Placement the tool that can assist with that goal and help students be very successful at the postsecondary level? It is evident that without rigor and the proper preparations for minorities and low-income students, our America will once again experience the Rigor Mortis of Education.

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