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**The Promise of “Early College” As
a High School Redesign Model**

WORKING PAPER

Dominic J. Brewer and Stefanie Stern

November 2005

CENTER ON Educational
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Executive Summary

Several national and international assessments have demonstrated that there has been little improvement in the performance of American high school students in recent decades. Students filter out from the educational pipeline at every level: of a given 100 students who begin ninth grade, only 68 leave as high school graduates, only 40 of those enroll in college immediately, and approximately 18 of the original 100 graduate from college on time. The poor performance problem of American high schools is due in part to an outdated industrial era model, ill suited for today's economy and society. The tracking system and low expectations contribute to lack of preparation for college.

One new approach to high school redesign, "early college", offers promise towards a rigorous academic course of study that engages students in college level work in grades nine through 14. Early college is a subset of dual enrollment programs that provides opportunities for students to complete high school and college credits with the same courses. The notion behind early college is that all students should have the opportunity to attend some form of postsecondary education and should be prepared accordingly.

Early college can succeed with the help of policymakers. A primary need is school-level autonomy so a flexible design can be utilized and students can be allowed multiple career and educational pathways that adhere to their interests and aptitudes. Agreements between colleges and public school districts to permit the granting of college-level credit to high school students for credit earned in early college high school (as well as transferring that credit to college as well) will be important. Eligibility requirements for participating students, aligning high school exit standards and college admission requirements, teacher certification, funding streams, and budget autonomy also need to be addressed. Lastly, adequate funding for counseling and assistance from schools will be imperative if early college is to support a greater variety of students in secondary and postsecondary success.

The Promise of “Early College” As A High School Redesign Model

Introduction

Education reforms come and go with great frequency, but the latest one to capture the imagination of policymakers, philanthropists and educators - high school reform – seems more promising. There are certainly few other areas of public education that need more attention: the nation’s more than 15,000 high schools are widely recognized as the “Achilles’ heel” of the educational system. Recent evidence suggests low levels of performance in core subjects, and huge numbers of students (particularly low income and minority) drop out before graduation, dramatically reducing the likelihood that they will attend and complete college. At a time when some postsecondary education is arguably critical for labor market success and the college-age population is at an all time high, the need for creative solutions to improve high school performance is imperative.ⁱ

In this paper, we review the evidence on the need for high school reform and some of the different approaches now being tried. One model, “early college”, that provides opportunities for participating students to complete high school and college credits with the same set of courses, builds logically on past efforts. We review the design and discuss some implementation issues that must be tackled for the model to succeed. We conclude from our review that the early college approach is a promising one for addressing the chronic problem of underperforming U.S. high schools.

The Evidence on High School Performance, Dropouts and College-Going

Before assessing possible approaches to reform, there has to be an understanding of the weaknesses of the conventional high school model. We start with a review of the evidence on the performance of U.S. secondary education.

First, academic performance of students is poor, exhibits wide disparity among students, and at best has been flat for a generation. The main evidence comes from the National Assessment of Educational Progress (NAEP). For example, only 36 percent of 12th graders read at or above proficient level and 26 percent write at proficient level. In mathematics the figure is 17 percent and in science it is 18 percent.

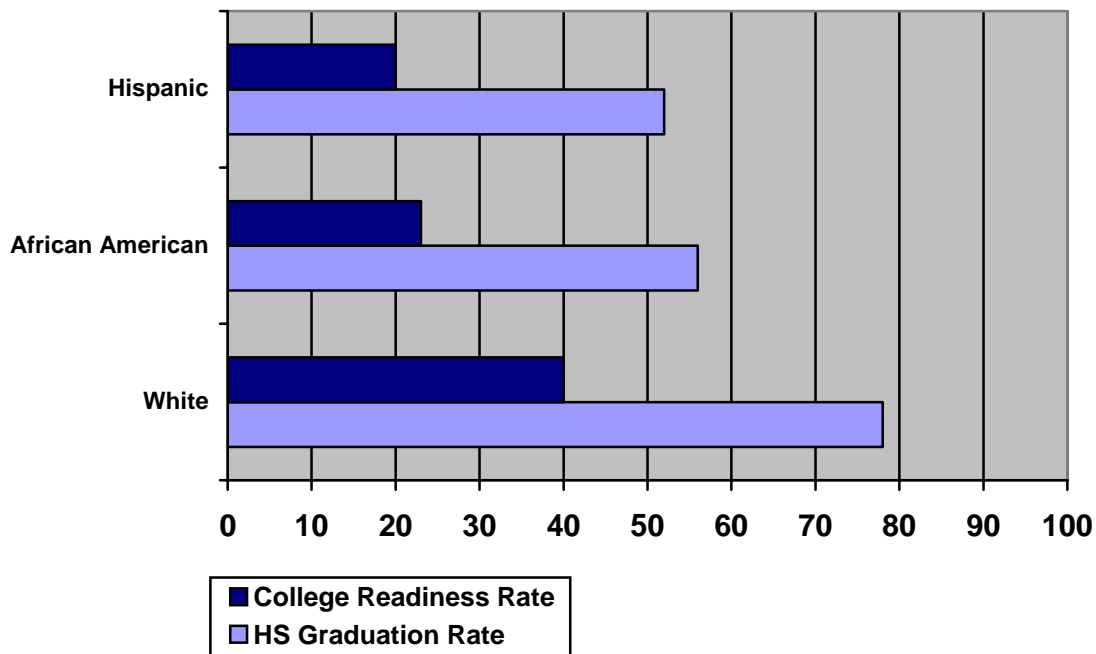
In terms of differences among students, the picture is striking with low-income and minority students significantly lagging the performance of their higher income and non-minority peers. Although there have been signs of progress at lower grade levels, there has been little change in this picture for some time. There was no statistically significant difference between the national average score of 17-year-olds in reading in 2004 and 1971, and in mathematics, there was no improvement from 1973 to 2004.ⁱⁱ

Additionally, only 22 percent of the 1.2 million high school graduates tested in 2004 met ACT’s three college readiness benchmarks, which “represent the level of achievement required for students to have a high probability of success (a 75 percent chance of earning a course grade of C or better, a 50 percent chance of earning a B or better) in such credit bearing courses as English Composition, Algebra, and Biology.”ⁱⁱⁱ This

conclusion is particularly striking because of the significant improvement in coursetaking patterns since 1983's *A Nation At Risk* began to focus attention on school performance.^{iv}

Second, large numbers of students drop out before the end of 12th grade. The poor academic picture is compounded by the fact that a significant number of students do not successfully complete high school. Although statistics on the extent of the problem are difficult to interpret because of differing definitions, the proportion of students who graduate on time from high school is generally estimated at 68-75 percent but for poor and minority children the figure is closer to 50 percent. Although there seems to have been some improvement in high school dropout rates during the 1970s and 1980s, the evidence is one of stagnation since the mid 1980s. The United States has slipped to 16th place in the world on high school completion rates, following countries such as Denmark, Germany, Poland, Greece, France, and the Czech Republic.^v A recent analysis concluded that the high school graduation and college readiness rates differ dramatically among types of students: 40 percent of White students, 23 percent of Black students and 20 percent of Hispanic students who started public high school graduated college ready (see Figure 1), where college readiness was “designed to reproduce the minimum standards of the least selective four year colleges” (graduation from high school, a minimum set of course requirements and to be able to read at a basic level).^{vi}

Figure 1: High School Graduation and College Readiness Rates



Source: Greene, J.P. and Winters, M.A. *Public High School and College-Readiness Rates: 1991-2002*. Education Working Paper. Manhattan Institute Report, February 2005.

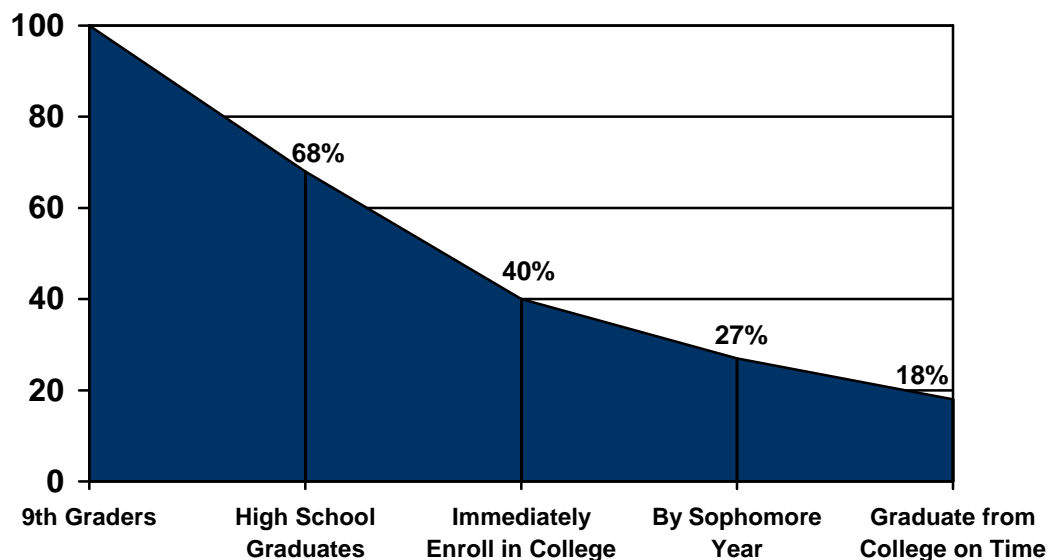
Third, while a significant number of students go to college, many are underprepared and do not complete any kind of terminal degree. One of the success stories of the

American education system is the high rate of college going – about two-thirds of high school graduates – and the numbers are at an historic high.^{vii} This picture, however, belies the fact that many students have already dropped out of high school, and those that do attend college often do not complete any terminal degree. Of those who attend, “half receive some type of degree within five years of entering postsecondary education, and about one-quarter receive a bachelor’s degree or higher. The most privileged students graduate at much higher rates than their less-advantaged counterparts: better than 40 percent of students in the top socioeconomic quartile graduate with a four-year degree, compared to only 6 percent of students in the lowest quartile. And White students are considerably more likely to receive a bachelor’s degree than Black and Hispanic students.^{viii} There is considerable ‘leakage’ from the college pipeline: approximately one in four of the students who enter four-year colleges and almost half of those who enter two-year colleges do not return for their second year.^{ix}

Many students require remedial coursework in college – for example, the National Center for Education Statistics reports that in 2000, 28 percent of college freshmen took at least one remedial course in reading, writing or mathematics.^x The need to take such courses means higher college costs for students and fewer potential slots available at colleges and universities for other students. Time to degree has been also been lengthening; only 51 percent of those enrolled in four-year institutions complete a degree within five years.^{xi}

To summarize, millions of students receive inadequate academic preparation in high school, drop out of high school, and fail to enter college or drop out of postsecondary education. Public education filters out 82 percent of all students before college graduation: more than 32 percent are screened out in high school, as are 41 percent between high school graduation and the start of college, 32 percent of college freshmen do not return and another 33 percent leave before college graduation. See Figure 2.

Figure 2: The Filtering of Students from the Educational Pipeline



Source: National Center for Public Policy and Higher Education, *Policy Alert*, April 2004. Data are estimates of pipeline progress rather than actual cohort.

All this evidence is troubling, particularly given the clear economic and social benefits of higher education. In 2004, the median annual earnings for workers aged 25 and older without a high school diploma was \$18,144; for a high school graduate \$25,360; some college or associate's degree, \$30,891; for a bachelor's degree \$42,404; and for those with graduate or professional education \$55,065.^{xii} Over a lifetime these differences become huge.^{xiii} The substantial benefits for many kinds of postsecondary education accrue in particular when programs are completed, rather than simply a few courses.^{xiv} There is growing evidence that the economic payoff to additional schooling beyond high school is increasing. The earning power of high school dropouts has been in almost continuous decline over the past 30 years. In 1971, male high school dropouts earned \$35,087 (in 2002 dollars), falling to \$23,903 in 2002, a decline of 35 percent. In the same period, the earning of female high school dropouts fell from \$19,888 to \$17,114.^{xv} Low educational attainment is also associated strongly with likelihood of being unemployed, crime and other problems that are costly to society.

A lot has been written about the kinds of skills that workers will require in the labor market of the 21st century, characterized by increased use of technology, flows of information and globalization. It has been estimated that two-thirds of new jobs between 2000 and 2010 require some postsecondary education.^{xvi} There is a sense that workers will need to be more flexible, changing jobs often, with an eye toward retooling. The best evidence is that the most successful workers will have a high level of basic academic skills^{xvii}, plus "soft skills" such as the ability to communicate, work in teams and so on as well as higher order technical skills in some fields. Many of these skills are developed at levels of education beyond high school.

Factors Underlying the High School Performance Problem

The U.S. high school is essentially a product of the industrial age. Until the beginning of the 20th century, most children were educated only at the primary level. With the dramatic expansion of access to secondary education, schools struggled to accommodate the large number of new students with a range of abilities. Given the rapid expansion occurred at a time when the skills required for the workplace were relatively straightforward and college options were limited, it was natural that high schools segmented the student population into distinct tracks – typically one college bound and one or two others not (general and vocational). Thomas Toch, an education journalist affiliated with the National Center on Education and the Economy, writes: "This utilitarian system of secondary education served the purposes of the nation's industrial economy. It taught traditional academic disciplines to lawyers, accountants and other professions and to the managerial class in industry. And it taught less demanding, more practical subjects to those headed into mills and onto assembly lines, where the work simply didn't require much advanced 'book learning'. High schools essentially served as a sorting mechanism, preparing students very differently for very different roles in the workforce."^{xviii}

High schools have changed little over the past 50 years despite major changes in the labor market, in higher education, and in the characteristics of the student population. The traditional American high school, as conceived a century ago, was never meant to produce well-educated workers in the numbers required by today's economy. The model has been labeled as "obsolete".^{xix} A recent nationwide survey found that 51 percent of the general public believed that high schools needed "major change" or a "complete overhaul" and 76 percent "say that America's ability to compete in the world would be weakened if 25 years from now high schools had not changed and still are operating the same as they do now."^{xx} The lack of relevancy and rigor in most high school courses leaves the majority of graduates unprepared for a job or college. Many students are convinced that school does not relate to their future, despite the fact that postsecondary aspirations are at an all time high.^{xxi} A survey of recent high school graduates reported that only 24 percent say they faced high expectations and were significantly challenged in high school.^{xxii}

The components of the conventional model that contribute to the poor performance include a muddled mission and a tracking system with associated low expectations.^{xxiii} Scholars have long documented the dysfunction of public high schools.^{xxiv} Marsh (1999) offers a representative view: "American high schools currently have so many priorities they are the masters of none. They dilute learning with an endless array of poorly articulated goals, when they need to set clear and compelling student performance standards. They are driven by rules and regulations, when they need to be driven by student performance results. They focus on curriculum coverage, when they need to focus on what students have learned from the curriculum. They encourage passive participation, when accountable action and strong incentives for success are needed. They encourage the sorting of students into self-fulfilling predictions of varied student performance, when relentless persistence to see that all students have learned is a better moral choice and feasible pedagogical approach. They alienate and distract students, when they should engage and support students and draw on the strengths of the community context for student learning."^{xxv}

Tracking within comprehensive high schools is more often a symbol of low expectations for a large number of students, and means a curriculum that typically does not adequately prepare students for college even though some form of postsecondary education is important for labor market success. Courses are often "watered down" and unstimulating, grade inflation is rampant and academic standards are low – students are just "passing through."^{xxvi} Boredom has been found to be an important factor in contributing to students dropping out of high school, both because the coursework is seen as having little relevance and is delivered in a way that fails to engage students.^{xxvii} In the last year of high school in particular there is a well documented "senior slump" as students have little incentive for hard work: "Short of a miserable failure in the senior year, practically every college-bound student knows that what they have accomplished through grade 11 will largely determine whether or not they attend college, and if so, which college. As a result, serious preparation ends at grade 11."^{xxviii}

Evidence that the academic standards in high school are low is illustrated by the significant remediation that colleges are forced to do in order to get students – who have a high school diploma - up to college level. Almost a third of first-year students are required to take remedial courses in reading, writing or mathematics, and low-income students are more likely than other students to need remediation courses.^{xxix} Roughly 80 percent of minority students in two-year colleges must enroll in one or more remedial

courses. Students required to take many remedial courses are more likely to drop out of college before receiving a degree.^{xxx} And remediation is very costly to institutions; it has been estimated that for public colleges alone the figure may be over \$1 billion annually.^{xxxi}

Another striking feature of American high schools is that they are typically very large. The average public school size in the United States is 752, but is greater than 1,000 in several states and schools of three or four thousand are not uncommon in urban centers.^{xxxii} Definitive statistical evidence on how student achievement is related to school size is hard to come by; indeed the research literature is inconclusive.^{xxxiii} Qualitative studies, however, suggests that while larger size makes the offering of specialized courses easier (indeed this was the original impetus for being large^{xxxiv}), it also results in highly impersonal learning environments and a more bureaucratic structure. Alienation and apathy among students and teachers are common.^{xxxv} In addition, there is on average only one certified counselor to 285 students in high schools, and the ratio is typically worse for schools serving high, at-risk populations.^{xxxvi} The lack of counseling, placement and support services in both high schools and college settings is worse in under-resourced and bureaucratic urban institutions. Students often face considerable stress and pressure from disruptive home and community environments, giving school less importance.

Many of the same factors contribute to reducing the likelihood a student will continue on to college. Once in a track where courses limit college entry and where there are no expectations for college going, it is very difficult for students to shift onto a different path. Despite the fact that rigorous high school coursework has been shown to be one of the strongest predictors of college graduation,^{xxxvii} many students believe that it is better to take less demanding courses in order to keep grades high.^{xxxviii} The problem is compounded by the fact that high school completion requirements are not aligned with college entry standards, at least those of many four-year institutions.^{xxxix} A major study of the disconnects between high school and college systems (often labeled “the great divide”) found that high school assessments often stress different knowledge and skills than do college entrance and placement requirements. Similarly the coursework between high school and college is not connected; students graduate from high school under one set of standards and three months later are required to meet a whole new set of standards in college.^{xli} The result is “no man’s land between high school and college in which the vast majority of students were neither expected nor prepared to traverse.”^{xlii} The entire organization of high school and college is completely different even though students are only a few months apart in terms of age. In high school, a student would typically be in class six hours a day, five days a week for 180 days a year for a total of more than a thousand hours of direct instruction. In college, a student may be in class 12-15 hours per week for 30 weeks a year, less than half the high school total, and is expected to work independently to a far greater extent.

Lack of academic preparation with rigorous coursework, combined with lack of knowledge about college and how it relates to career options, means a high percentage of high school students are not prepared to do college level work. Students have been shown to have a lot of misconceptions about college, including the extent of financial barriers to entry, and limited knowledge of what it takes to enroll and finish.^{xliii} Knowledge of how to apply to college is low.^{xliii} Finally, the move from high school to college represents a major psychological transition – “frequently students who do not persist in college cite non-academic factors as reasons for dropping out: they are

overwhelmed by the new institution, they are unfocused, or they had unrealistic expectations of the college experience.”^{xliv}

These factors are particularly salient for low-income students, and are reinforced by family and work obligations and a lack of support from friends and parents, especially among those whose parents did not themselves go to college. “Students may be unsure of how to apply to college or how to pay for it; they could be academically unprepared for higher education; or they may face what can be a frustrating task of balancing school and work while searching for a course of study that will place them in a meaningful career path.”^{xlv} Tuitions have been increasing much faster than family income and other prices: over the last 20 years, college tuition has risen 296 percent compared to 83 percent overall.^{xlvi} Again, this trend particularly affects low-income students.

High School Reforms

The preceding analysis suggests that improving high school performance and in particular, raising the preparation of students for college work and ensuring their successful transition to postsecondary education is a considerable challenge. Although many aspects of education have been the object of reform over the past few decades, high schools have rarely been the focus. There are several types of reform: (i) changes to graduation requirements and introduction of exit exams; (ii) federal and state programs geared toward increasing college going for underrepresented populations; (iii) comprehensive school reform models, and (iv) charter schools.

Perhaps the major change that has taken place came in response to *A Nation at Risk* that emphasized weak academic preparation of students. This led most states to raise high school graduation requirements and has resulted in a dramatic increase in coursetaking in key content areas, although it may also have increased the “shopping mall” flavor of high schools.^{xlvii} More recently, a growing number of states have adopted high school exit exams as a method of reform. Currently, 19 states require the successful completion of an exit exam in order to graduate and more are in the process of implementing one. While research on the effects of exit exams remains in its infancy, initial results suggest “exit exams are having positive effects on curriculum and instruction by encouraging school districts to cover more of the content included in state standards in areas tested.”^{xlviii} Whether state standards are sufficiently high and well developed to drive major changes within high schools remains to be seen. Considerable work still needs to be done to improve the alignment between high school exit and college entry requirements.

A second strand of high school reform has been aimed at providing additional support to improve rates of college going among low-income and minority students who have historically been underrepresented in postsecondary education. Examples of these programs include GEAR UP, UPWARD BOUND, TRIO, IHAD, Puente, MESA, and AVID. These programs, many government-funded and starting with students from middle school onward, involve activities such as additional help to students in preparing for the PSAT/SAT, college fieldtrips, assistance with college applications and financial aid forms, and so on. The evidence on the efficacy of these programs is scant – impacts are generally unproven or negligible – and there is considerable variation in implementation. Often success or failure is due to a particular school district, institution, or individual making going to scale problematic. As with high school exit exams, such

programs in isolation do not address all the important elements of the high school performance problem, including the lack of college-going expectations and coursework for all students, the articulation between secondary and postsecondary education, and the information gap about career pathways and the importance of college.

A third type of high school reform over the past two decades has been the introduction of “comprehensive school reform” models in some schools, typically based on a “design” built around curriculum, pedagogy and school organization. The intent is to more systematically address the entire set of factors that contribute to poor performance. Sponsored by organizations such as New American Schools^{xlix} and supported by philanthropic foundations as well as the federal government, a number of models have received widespread adoption. However, the most prevalent models have been at the elementary level. At the high school level, two major examples are “America’s Choice,”^{li} which is in more than 500 schools in 15 states and stresses college preparation activities, and “Talent Development High Schools,”^{lii} specifically geared toward large poorly performing high schools including organizational and management changes, curricular and instructional innovations to prepare all students for high-level courses in math and English, parent and community involvement to encourage college awareness, and professional development to support the recommended reforms. Few of the models have been systematically evaluated in a manner that permits robust conclusions about their effectiveness. The overarching finding of a 10-year examination of New American School designs pointed to some successes but also many failures with wide variance in the quality of the implementation, and traditional state and district structures failing to support the changes being attempted at the school level.^{liii} Although some models have exciting and important elements that would appear to be a needed part of high school reform, rarely do they address all the elements, and direct relationships with the postsecondary sector are weak.

Fourth, partly reflecting the frustration of working within the confines of a heavily regulated, bureaucratic public structure, charter schools – schools that operate with public money but are exempt from most state and district rules and regulations – have grown dramatically since they were first introduced in 1991 in Minnesota.^{liiii} Today 40 states and the District of Columbia permit charter schools, and they serve more than a million students across the country. The majority of charter schools that have been established have been at the elementary level, reflecting the difficulty of operating a high school, but there are some innovative high school charter schools.^{liiv} Some charter schools have been very successful, attracting widespread parental and community support, producing innovative curricula and pedagogical approaches, and helping improve student achievement. Others have foundered, and some have closed. Since many charter schools are new and students choose to attend them, it is a challenge to determine whether they improve student achievement to a greater or lesser extent than traditional public schools. Statewide or nationwide averages are likely to be misleading, but determining the most reasonable comparison is also tricky, and there is a limited availability of student-level longitudinal data, which would permit more definitive analyses.^{liiv} One of the more comprehensive studies in California found that on average classroom-based charter schools outperformed traditional public schools with similar student populations, but non-classroom-based charters do not do as well.^{livi} A more recent study found that California’s charter schools “significantly outperformed regular public schools” on student achievement in 2004, and that a significantly higher amount of charter schools met their performance targets compared to regular public schools.^{liiii} Interpretation of charter school outcomes remains controversial, however.

Early College: Building On Other Approaches

One relatively new approach to high school reform is “early college.” This model blends “high school and the first two years of college, with the goal of moving low-income and poorly prepared students toward the associate’s or bachelor’s degree in fewer than the six years it would normally take to get from grades nine through 14.”^{lviii} Conceptually, early college makes sense because it addresses the critical underlying causes of the high school performance problem discussed previously. There are now almost 200 early college high schools nationwide and the number is growing every year. Many of these schools operate as charter schools, as the model requires a good deal of flexibility in terms of school organization, curriculum, pedagogy, and resource allocation.

The premise of early college is that all students can and should go on to some form of postsecondary education, includes rigorous academic basics and a clear career pathway that begins to address the lack of accurate information on student’s options. By being “customized” to students’ needs, it represents a significant break from the “one-size-fits-all” approach in conventional schools and therefore has a greater chance of maintaining students’ interest. By making the transition from high school to college seamless it, in principle at least, can reduce the likelihood of attrition. Further, by completing college-level work earlier, time to degree and college costs should be reduced. Senior year of high school is fully utilized in this model and students are exposed to college level work reducing the need for costly remediation when students reach college.

The programmatic details of the early college approach differ from school to school, allowing some adaptation to local needs and capacity. Typically, the new high schools are created through formal agreements between secondary and postsecondary institutions. In general, ninth grade students, regardless of their academic preparedness, choose a career and degree “pathway” as part of a motivating course of study; each student’s academic skills, aptitudes and interest are evaluated, and students are given realistic insight into career options. Hence students are not “tracked” in the conventional sense. The model forwarded by the Bill and Melinda Gates Foundation includes nine themes: allied health and medicine; biotechnology; engineering; international business; liberal arts; linguistics; mathematics, science and technology; Native American culture; and teacher preparation.^{lix} In the 10th grade, students begin to take college level courses relevant to their chosen path. Courses include basic academics, pathway specific courses and also “college life” and career planning. Ideally, students graduate from high school with a diploma, an associate’s degree and enough credits to qualify them as college juniors. Early college schools seek to emphasize high career-driven expectations for students, to encourage use of technology and “active” learning, involve parents and allow time for staff collaboration.

Since 2001 more than \$124 million has been committed to the creation of more than 170 early college high schools in 25 states, with funding provided by major national foundations (including Gates, Kellogg, Carnegie and Ford). These schools are typically small, nearly three quarters have at least a 50 percent minority student body and half of early college students are on free and reduced price lunch.^{lx} Most of the schools require

waivers from district rules and many are charter schools. Some are conversion schools while some are completely new; some offer courses at the high school site, others at a local college; and some teach all courses with high school teachers while others utilize college faculty. Although the initiative is being evaluated, the complexity of the rollout, selection of schools, and relative newness of the reform model means that there is no data on the efficacy and scalability available at this point. A range of approaches are being used at the different school sites, but there are anecdotal data on individual early colleges that suggest promise. The most often cited example of early success is that of Bard High School Early College in New York which opened in 2001, and where 90 percent of the first graduating class went on to college, a majority as sophomores or juniors.^{lxi} An early indicator of success of early college high schools is whether they are able to enroll a student body that is primarily drawn from underrepresented groups and to minimize attrition in ninth and 10th grades; to date the Gates models have been fairly successful in this regard. Of course, the ultimate test is whether the students at these schools graduate from high school, do so with some college credit, and enroll in postsecondary institutions.

Although early college is a relatively new and as yet unproven remedy for high school performance problems, it shares some similarities with a couple of other efforts. One is "Tech Prep," a federal and state initiative that offers students "planned pathways that link high school to technical education at college." The roots of Tech Prep can be traced to the late 1960s when a few states began encouraging high school-community college linkages. In 1984, the National Commission on Secondary Vocational Education endorsed Tech Prep and the idea spread rapidly, culminating in funding through the federal government, and the Tech Prep Education Act. However, although there is some evidence that Tech Prep produced some positive effects on outcomes^{lxii}, the "initiative is often hampered because it is perceived as a high school vocational program."^{lxiii} Because of its association with vocational education, it is not really perceived as college.

More significant has been the growth of "dual enrollment" initiatives, which provide college credit to high school students for certain courses.^{lxiv} Such arrangements have a long history as private agreements between high schools and colleges, but it was not until the 1980s that states began developing formal dual credit policies.^{lxv} The Education Commission of the States reports that dual enrollment exists in some form in nearly every state and 18 mandate that dual enrollment opportunities be provided to students.^{lxvi} Nationally, most public high schools offered dual credit of some sort (71 percent offered dual credits in 2002-2003) and about half of all Title IV degree-granting institutions, particularly two-year colleges, had high school students taking courses for college credit within dual enrollment programs.^{lxvii} In 2005, the Bush administration requested \$125 million from Congress to increase access to dual enrollment for at-risk students, although ultimately this was not approved.

Like early college, the supporters of dual enrollment argue that it helps lower the cost of postsecondary credit, prepares students for the academic rigors of college by giving them direct exposure to college-level work, gives students more realistic information on college, prevents reduced effort during the high school senior year and provides additional curricular options for students. By requiring partnerships between high schools and colleges, it also forces greater collaboration between the institutional players in the educational system. When demands on state systems are increasing, dual credit is a way to accelerate the progress of students in postsecondary institutions,

freeing up college slots and permitting more students to be served, as well as resulting in a reduced need for postsecondary remediation.^{lxviii} There are a few examples of abuse of dual enrollment programs by colleges eager to enhance enrollment.^{lxix} Most significantly, dual credit programs tend to be “add-ons” to high school offerings, and therefore do not do much to improve the capacity of high schools, and rarely are they geared to all students.

Dual enrollment programs vary widely from state to state on a number of dimensions. There is considerable variation in the form of these programs ranging from student eligibility criteria to course content. Some are taught by regular college faculty on a college campus along with regular college students, and some by specially certified high school teachers at the high school with no college students. In some variants, students receive college credit immediately while others grant “credit in escrow” whereby the student must enroll in a postsecondary institution to get credit. The major difference between most dual enrollment programs and early college is that the former has historically been geared towards high achieving students, placing them on an accelerated path. Nationally, for example, dual enrollment is less likely to be present in schools with the highest minority populations and it has been found in some states that minority and low-income students are less likely to participate.^{lxx} More recently, some dual enrollment programs have attempted to target at-risk students, although there remains concern in some quarters that some of these students may not be ready for college level work.^{lxxi}

Given the considerable variation among the forms of dual enrollment programs and the fact that they have been offered to a self-selected group of students, research on their efficacy is sparse. There are unfortunately no randomized trials that would permit a certain determination of whether such programs had positive impacts on students in terms of higher probabilities of staying in and completing high school, attending and successfully completing college, cost savings from reduced time to degree, and so on.

One recent review of 45 studies on dual enrollment, Advanced Placement (AP), International Baccalaureate (IB) and Tech Prep, concluded that although there was little rigorous evidence what there was, was largely positive.^{lxxii} The same authors have written: “We are only beginning to get a sense of the impact of dual enrollment programs on students. The minimal research available certainly indicates that participants and educators, both in high schools and in community colleges, are enthusiastic about the strategy. Students do proceed on to college and have more success there than the typical high school student, although this may reflect the characteristics of the dual enrollments students rather than the effects of the program. The very small numbers of studies that control for high school grades at least begin to take account of selection effects, and such studies still show positive effects. In any case what we know so far is positive enough to warrant further experimentation and assessment.”^{lxxiii} Another review of the evidence reached a similar conclusion, “most studies indicate that dual credit students do well in college.”^{lxxiv}

A few specific studies are worth mentioning, although none are able to fully address the issue of selection into these programs. A recent examination of Texas longitudinal data concluded that high school students in that state who concurrently enroll in postsecondary courses experience greater success in college. Indeed, they are twice as likely to graduate from college in four years as those who did not enroll in such a program: “we find consistent evidence that dual credit students share many of the

academic advantages of students who take AP courses.^{lxxv} Nationally, four-year college students who participated in a high school dual enrollment program have, on average, a higher college GPA and a higher four-year graduation rate than students who did not participate in such a program.^{lxxvi} There are a large number of additional studies of a single state or institution.^{lxxvii}

In general, the limited research evidence gives some cause for optimism about dual enrollment approaches. There are some potential downsides, of course. The large literature on school reform design and implementation suggests that local contextual factors can cause significant variation in how well programs are implemented and this ultimately will affect the benefits and costs. If the program is structured so that college faculty teach the high school students there is some additional cost for taxpayers,^{lxxviii} but if they are taught by high school teachers there may be concerns about instructional quality. In many of the neediest schools, teachers are often relatively new and many are teaching out of field particularly in key subject like mathematics and science.^{lxxix} Over the long run, it seems likely that such programs would be cost effective since they reduce time to degree and yield additional economic and social benefits from higher levels of education. Of course, the nature and quality of students' overall educational college experience is different; any evaluation of these effects would require an extensive long-term study.

Helping Early College Succeed

Although we do not yet have systematic evidence, the early college model is a highly plausible approach to reforming the nation's underperforming high schools – students simply do not fit in a one-size-fits-all model and do not see how high school is relevant to their futures. First, it has considerable “face validity” in that it systematically addresses the underlying causes of the high school performance problem. Second, the evidence we have from dual enrollment or other programs is at least suggestive of the idea that raising expectations for students and engaging them in college level work can produce tangible benefits. Implemented at scale, early college could have a profound impact on reducing dropout rates and increasing retention of students in high schools, increasing the number of students entering college, reducing the need for remediation and increasing the chances for postsecondary success. However, to achieve this goal will require a good deal of resourcefulness on the part of early college advocates. Assistance from policymakers at the local, state, and federal levels could undoubtedly spur the adoption of the model and strengthen its chances of success.

What are the key policy dimensions to help promote dual credit and early college? State and district policies can make implementation difficult by regulating course location, instructor credentials, or access to programs. Perhaps the primary need is for policies that grant schools autonomy so that a flexible design can be utilized. This means enabling charter school legislation or an openness to arrangements with public school districts that permit alternatives. Even better would be a significant change in existing state regulations regarding high school graduation requirements and statutes that limit the granting of college level credit to high school students (several states currently have such limitations). These regulations typically specify a “one-size-fits-all” single career/educational pathway when the early college model emphasizes the need for multiple pathways that anticipate students' interests and aptitudes. For early college to fulfill its promise, it must be available to all students, not just students who are

academically gifted. Schools must also have the resources to provide enhanced counseling and support mechanism for students.^{lxxx}

Two recent reports have provided a comprehensive analysis of how state policies could be used to assist early college. Policy development is needed in a number of areas in order to support early college.^{lxxxii}

- *College courses can supplant high school courses.* Currently there are often restrictions on the use of college courses to fulfill requirements for high school seat time, or states allow a choice of *either* high school or college credit but not both, or there are caps on the number of college courses high school students can take. Removal of these kinds of restrictions would help smooth the establishment of combined high school and college courses.
- *Eligibility requirements for college courses are based on student readiness in subject area.* Some states have limitations on access to dual enrollment courses based on assessment scores or GPA or there may be restrictions based on age or grade level. If dual credit and early college is to fulfill its promise as a widespread reform that raises expectations for all students, entry restrictions would need to be lifted.
- *Credits for early college high school are transferable to two- and four-year institutions.* Most states have no systematic means of equating courses across high school and college. Many colleges have unique prerequisites set by academic departments that can only be satisfied within the institution. And there may be uncertainty from four-year colleges regarding admission status of students with dual credit courses. All these institutional barriers need attention.
- *Teacher certification is flexible.* State and union regulations may prohibit college instructors teaching high school students or high school teachers may not be able to become adjunct college faculty. Flexible kinds of certification arrangement must be permitted to encourage the adoption of early college.
- *Secondary and postsecondary funding streams can be merged.* A number of barriers to expansion of dual enrollment and early college programs exist currently due to the way schools and colleges are funded. For example: there may be a lack of FTE reimbursement for dual enrollees at four-year institutions; high school students are ineligible for federal and state financial aid; high schools lose dollars when students leave, discouraging high school participation in dual enrollment; funding rules to pay for per credit costs are typically inflexible. Developing a stable and equitable funding mechanism for early college strategies will be key to their long term spread and success.
- *Schools have autonomy.* As has been mentioned earlier, there is often insufficient autonomy at the school level from state and district decision makers to permit the introduction of major changes to the way high schools are organized. Policies that do not comparably fund charter schools or do not hold them accountable distinctively from regular public schools, for example, thereby inhibit the adoption of early college high school.

In order to implement these recommendations, states will need to establish governance mechanisms that cross the boundaries between high school and postsecondary education, ensuring, for example, that high school exit standards are aligned with college admission requirements. Similarly, the existing system of accreditation, both of high schools and of colleges and universities, will need to be amended given that early college high schools straddle both sectors.^{lxxxiii} States will also need to establish a data

system that enables the tracking of students as part of a single K-16 system, something which today is very rare.

Tackling America's high school performance problem is a huge undertaking, but a critical one. The scale of the problem is massive with a high number of dropouts, particularly among low-income and minority students, and lackluster academic standards reflected in stagnant achievement levels and widespread college remediation. Reforms that promote student retention, raise academic expectations and increase college-going are needed. The early college model, built on the premise that all students should have the opportunity to attend postsecondary education and be prepared accordingly, is a conceptually sound approach, with encouraging early anecdotal evidence. The approach is particularly promising because it is aimed at helping students who have traditionally been underrepresented in postsecondary institutions. However, unlike programs that are additions at the "margin" of conventional schools, early college seeks to raise expectations for all students and do so as part of a core high school redesign. Undoubtedly, implementation on a large scale will face many barriers, not least of which is the general lack of flexibility in the existing public school system and a long history of disconnected K-12 and postsecondary educational sectors. The good news is that there is now widespread recognition of the need for high school reform -- there are innovative models that might make it a reality.

Glossary

Accreditation: Recognition by an accrediting organization or agency that a college meets certain acceptable standards in its education programs, services, and facilities. (College Board glossary http://www.collegeboard.com/highered/res/asc/got/got_g_o.html)

Advanced Placement (AP) courses: College-level courses taught in high school. Students may take an examination, provided by College Board, at the completion of the course; acceptable scores allow students to earn college credit toward a degree, certificate, or other formal award. (IPEDS glossary <http://nces.ed.gov/ipeds/glossary/index.asp?text=1>)

Charter school: A charter school is a publicly funded school that has been granted a charter exempting it from selected state or local rules and regulations. A charter school may be a newly created school or it may previously have been a public or private school. In return for funding and autonomy, the charter school must meet accountability standards. A school's charter is reviewed (typically every three to five years) and can be revoked if guidelines on curriculum and management are not followed or the standards are not met. (The NCES Condition of Education glossary <http://nces.ed.gov/programs/coe/glossary/c.asp>)

College ready: This term has been used to describe whether a student has completed high school with the skills and aptitude to enter and succeed in college. ACT Inc. approximates college readiness by establishing the cut scores at which students are more than 50 percent likely to persist from the first year of college to the second. The other common definition is whether students have completed the high school courses required for college application. (The Cherry Commission glossary <http://www.cherrycommission.org/docs/finalReport/CherryGlossary.pdf>)
Note: Green and Winters in "Public High School and College-Readiness Rates: 1991-2002" (see figure 1) define college ready using a combination of factors, namely, obtaining a high school diploma, meeting a minimum set of course requirements, and being able to read at a basic level.

Comprehensive School Reform: An approach to school improvement where entire schools are redesigned and revitalized with a focus on enhanced teaching and learning. The key is the word comprehensive; the school reform plans are not piecemeal but integrate all factors that influence teaching and learning. (Southwest Educational Development Laboratory <http://www.sedl.org/pubs/change46/7.html>)

Credit-in-escrow: A course that is part of an articulated Tech Prep agreement between a public high school and community college. After high school graduation, the student continues at community college and, after successfully completing a college class, is awarded credit-in-escrow for previous high school course work. (Austin Community College <http://www.austin.cc.tx.us/orgref/glossary.htm#c>)

Dropout: The term is used to describe both the event of leaving school before graduating and the status of an individual who is not in school and who is not a graduate. (The NCES Condition of Education glossary <http://nces.ed.gov/programs/coe/glossary/d.asp>)

Dual enrollment: An umbrella term used to describe an array of programs that allow high school students to enroll in courses where they can simultaneously earn both high school and college credit. Students are not required to apply for admission to the college in order to participate. (IPEDS glossary <http://nces.ed.gov/ipeds/glossary/index.asp?text=1>)

Early college or middle college: A subset of dual enrollment programs that includes the collaboration of high schools and colleges to provide opportunities for participating students to complete high school and college credits with the same course(s). The middle-college focus shifts away from high-achieving students to either a broad spectrum or an emphasis on middle- and low-achieving students. (The Cherry Commission glossary <http://www.cherrycommission.org/docs/finalReport/CherryGlossary.pdf>)

Exit examination: A state-defined test, or series of tests, which students must pass in order to graduate from high school. The examination and all of its components are established by the state and vary greatly state by state. End-of-course examinations are taken to meet curriculum standards; minimum competency examinations assess baseline knowledge; and standards-based examinations are aligned with state-adopted requirements at a particular grade level. (NCES Condition of Education glossary <http://nces.ed.gov/programs/coe/glossary/e.asp>)

International Baccalaureate (IB): A comprehensive and rigorous two-year curriculum (usually taken in the final two years of high school) that is similar to the final year of secondary school in Europe. The IB is internationally licensed by the International Baccalaureate Organization (IBO). The program places a strong emphasis on the ideals of international understanding and responsible citizenship. Some colleges award credit or advanced placement to students who have completed an IB program. (College Board glossary http://www.collegeboard.com/highered/res/asc/got/got_g_o.html and NCES Condition of Education glossary <http://nces.ed.gov/programs/coe/glossary/i.asp>)

K-16 model: An umbrella term used to describe a policy and structural shift toward preparing all students for postsecondary education and minimizing the barriers for those who choose to pursue it, in recognition of the fact that a postsecondary credential is fast becoming the standard for employability in the marketplace. This often translates into efforts to align the high school course requirements with postsecondary admissions expectations and high school assessments with college placement exams. This term often refers to seamless policy and practices between the K-12 and postsecondary systems. (The Cherry Commission glossary <http://www.cherrycommission.org/docs/finalReport/CherryGlossary.pdf>)

No Child Left Behind (NCLB): The most recent reauthorization of the Elementary and Secondary Education Act (ESEA) of 1965, NCLB is the federal version of standards-based reform. Key provisions of the bill include testing requirements at multiple levels of student performance, establishment of baseline school pass rates, and focuses states and schools on making adequate yearly progress (AYP) toward the goal of 100 percent passing for students in mathematics and reading by 2014 in grades three through eight, plus high school. The legislation includes mechanisms for accountability, including designation of schools that do not achieve AYP, and requires supplemental services in persistently underperforming schools, instituting school choice after a certain number of consecutive years of not making adequate progress, and eventually, restructuring of

schools that fail to make AYP for a specified number of years. (The Cherry Commission glossary <http://www.cherrycommission.org/docs/finalReport/CherryGlossary.pdf>)

Remedial education: Instruction for a student lacking the reading, writing, mathematics, or other skills necessary to perform college-level work at the level required by the attended institution. (NCES Condition of Education glossary <http://nces.ed.gov/programs/coe/glossary/p.asp>)

Talent development high school: The talent development high school is a comprehensive reform model for large high schools that face serious problems with student attendance, discipline, achievement scores, and dropout rates. The model consists of specific changes in school organization and management to establish a strong, positive school climate for learning; curricular and instructional innovations to transition all students into advanced high school work in English and mathematics; parent and community involvement activities to encourage college awareness; and professional development systems to support the implementation of the recommended reforms. (Center for the Social Organization of Schools, Johns Hopkins University <http://www.csos.jhu.edu/tdhs/about/model.htm>)

Tech Prep: Based mostly on the articulation agreements between local high schools and community colleges, the Tech Prep model relies on the development and execution of a 2+2 core technical curriculum, signifying that the last two years of high school would provide a seamless transition to the first two years of college. These programs receive funding from Perkins legislation. (National Research Center for Career and Technical Education <http://mjc.yosemite.cc.ca.us/president/TechPrep/PromisingOutcomes-Bragg.pdf>)

Tracking: The educational practice of placing students in a series of classes or a curricula targeted at a specified achievement or ability level. Examples of tracking include vocational/technical and college preparation. (Center for Research on Education, Diversity & Excellence <http://www.crede.org/tools/glossary.html>)

Vocational education: Organized educational activities that offer a sequence of courses that provide individuals with the academic and technical knowledge and skills needed to prepare for further education and for careers requiring less than a bachelor's degree. At the high school level, vocational education consists of occupational education, general labor market preparation, and family and consumer sciences education. (NCES Condition of Education glossary <http://nces.ed.gov/programs/coe/glossary/p.asp>)

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The views expressed here are solely those of the authors.

Notes

ⁱ For example, this is a common theme of U.S. Secretary of Education Margaret Spellings' speeches: "We know that if we're going to remain economically competitive in the world, and viable as a civic democracy, that we're going to have to get more people educated to higher levels." "Getting every child to graduate high school – with a meaningful diploma in hand – is one of the biggest challenges our country faces." The sentiment is echoed by numerous businessmen; for example, Bill Gates recently said, "Until we design high schools to meet the needs of the 21st century, we will keep limiting – even ruining – the lives of millions of Americans each year. If we keep the system as it is, millions of children will never have a chance to fulfill their promise."

ⁱⁱ U.S. Department of Education. National Assessment of Educational Progress. *The Nation's Report Card. NAEP 2004 Trends in Academic Progress: Three Decades of Student Performance in Reading and Mathematics. Findings in Brief.* [NCES 2005-463]. Washington, DC: National Center for Education Statistics, 2005.

ⁱⁱⁱ ACT. *Crisis at the Core: Preparing All Students for College and Work.* ACT, Inc. 2004. [\[http://www.act.org/path/policy/pdf/crisis_report.pdf\]](http://www.act.org/path/policy/pdf/crisis_report.pdf)

^{iv} In 1982, 14% of high school students took minimum coursework recommended by *A Nation at Risk*; in 1994, 51% of students did. (Jennings, J and Rentner, D.S. "Youth and School Reform: From the Forgotten Half to the Forgotten Third" in *The Forgotten Half Revisited: American Youth and Young Families, 1988-2008.* Samuel Halperin, Ed. Washington, DC: American Youth Policy Forum, 1998, pp. 83-100.)

^v See "Accountability for Better Results – A National Imperative for Higher Education," National Commission on Accountability in Higher Education, State Higher Education Executive Officers (SHEEO), 2005. p.10. <http://www.sheeo.org/account/accountability.pdf>

^{vi} Greene, J.P. and Winters, M.A. "Public High School and College-Readiness Rates: 1991-2002". Education Working Paper. Manhattan Institute Report, February 2005. See pp. 6-7 for a discussion of the data used to construct the college readiness measure.

^{vii} For example, 66.7% of the graduates of the high school class of 2004 were enrolled in colleges or universities in October of that year, according to the U.S. Department of Labor's Bureau of Labor Statistics ("College Enrollment and Work Activity of 2004 High School Graduates". BLS. Washington, DC, March 2005.)

^{viii} Kahlenberg, Richard D., Ed. *America's Untapped Resource: Low-Income Students in Higher Education*, New York: The Century Foundation Press, 2004, p. 22.

^{ix} Education Trust. "Thinking K-16: A New Core Curriculum for All", Thinking K-16: 7(1), Winter 2003. http://www2.edtrust.org/NR/rdonlyres/26923A64-4266-444B-99ED-2A6D5F14061F/0/k16_winter2003.pdf+related:www.massinsight.org%2Fdocs%2FLessonsLearned.pdf

^x National Center for Education Statistics, *Remedial Education at Degree-Granting Postsecondary Institution sin Fall 2000.* Washington, DC. 2003.

^{xi} Kirst, M.W. and Venezia, A, Eds. *From High School to College: Improving Opportunities for Success in Postsecondary Education.* San Francisco: Jossey-Bass, 2004, p. 12.

^{xii} U.S. Census Bureau. 2004. "Median Earnings in the Past 12 Months (in 2004 inflation-adjusted dollars) by Sex and Educational Attainment for the Population 25 Years and Over", [\[http://factfinder.census.gov/servlet/DTTable?_bm=y&-geo_id=D&-ds_name=D&-lang=en&-mt_name=ACS_2004_EST_G2000_B20004\]](http://factfinder.census.gov/servlet/DTTable?_bm=y&-geo_id=D&-ds_name=D&-lang=en&-mt_name=ACS_2004_EST_G2000_B20004)

^{xiii} U.S. Census Bureau, Current Population Reports. "The Big Payoff: Educational Attainment and Synthetic Estimates of Work-Life Earnings." [P-23 210]. July 2002, p. 7. [\[http://www.census.gov/prod/2002pubs/p23-210.pdf\]](http://www.census.gov/prod/2002pubs/p23-210.pdf)

^{xiv} There is agreement that two-year colleges add significant economic value for those who attend them, though there is some debate over the extent to which there are benefits from partial course

completion. See, for example, W.N. Grubb, "Learning and Earning in the Middle, Part I: National Studies of Pre-Baccalaureate Education" in *Economics of Education Review* 21, 2002. pp. 299-321 and T.J. Kane and C. Rouse, "Labor-Market Returns to Two- and Four-Year College" in *American Economic Review*, 85(3), 1995, pp. 600-614. See also E. Pascarella, "Community College Effects on Students: A Review of Recent Evidence", an Iowa Academy of Education Occasional Research Paper #1, August 1999. [<http://www.finefoundation.org/IAE/iae-z-op-pascarella-1.pdf>]

^{xv} *One Third of a Nation: Rising Dropout Rates & Declining Opportunities*, Educational Testing Service, February 2005. [http://www.ets.org/Media/Education_Topics/pdf/onethird.pdf]

^{xvi} Carnevale, A. and D. M. Desochers, *Standards for What? The Economic Roots of K-12 Reform*, Educational Testing Service, 2003.

^{xvii} There is evidence that the payoff to basic academic skills is increasing. See R. Murnane, J. Willett and F. Levy, "The Growing Importance of Cognitive Skills in Wage Determination", *The Review of Economics and Statistics*, 77(2) May 1995, pp. 251-266.

^{xviii} Toch, Thomas. *High Schools on a Human Scale: How Small Schools Can Transform American Education*, Beacon Press, 2003, p.3.

^{xix} "Our high schools are obsolete. By obsolete, I don't just mean they are broken, flawed and under-funded – although I can't argue with any of those descriptions. What I mean is that they were designed 50 years ago to meet the needs of another age...The idea behind the old high school system was that you could train an adequate workforce by sending only a small fraction of students to college, and that the other kids either couldn't do college work or didn't need to...We have to do away with the outdated idea that only some students need to be ready for college and that the others can walk away from higher education and still thrive in our 21st century society." Bill Gates [<http://www.alternet.org/story/21399/>] See also [<http://www.gatesfoundation.org/MediaCenter/Speeches/BillgSpeeches/BGSpeechNGA-050226.htm>].

^{xx} Educational Testing Service, *Ready For The real World? Americans Speak on High School Reform. Executive Summary*. June 2005.

^{xxi} College aspirations have risen dramatically in last two decades with today's youth attracting the moniker "the ambitious generation". A study by Sloan Foundation says 90% of current high school seniors expect to attend college compared to 55% in the 1950s as quoted in B. Schneider and D. Stevenson, *The Ambitious Generation: Americas Teenagers, Motivated but Directionless*, New Haven: Yale University Press, 1999.

^{xxii} *Rising to the Challenge: Are High School Graduates Prepared for College and Work?* Achieve, Inc., February 2005.

^{xxiii} U.S. Department of Education, Office of Vocational and Adult Education. "Preparing America's Future: The High School Symposium" Washington, DC, April 4, 2002. Chester Finn cites seven ailments of high schools, namely, mission confusion, remediation, scale, pupil motivation, obsolete notions of teaching and learning, changing lives and career patterns, and the proliferation of rival providers. [<http://www.ed.gov/about/offices/list/ovae/pi/hs/pafsymp.doc>]

^{xxiv} There are numerous excellent portraits of high schools, many written in the 1980s. See, for example, *The Good High School: Portraits of Character and Culture* (1985) by S.L. Lightfoot or *The Shopping Mall High School: Winners and Losers in the Educational Marketplace* (1985) by A.G. Powell, E. Farrar, and D.K. Cohen.

^{xxv} Marsh, D.D. and Codding, J.B., Eds. *The New American High School*, Thousand Oaks, CA: Corwin Press, Inc., 1999, p. 182.

^{xxvi} Codding, J.B. and Rothman, R. "Just Passing Through: The Life of an American High School" in Marsh, D.D. and Codding, J.B., Eds. *The New American High School*, Thousand Oaks, CA: Corwin Press, Inc., 1999, p. 13.

^{xxvii} Farrell, E. et al, "Giving Voice to High School Students: Pressure and Boredom, Ya Know What I'm Sayin'?", *American Educational Research Journal*, 25(4), Winter 1988, pp. 489-502.

^{xxviii} National Commission on the High School Senior Year. *The Lost Opportunity of the Senior Year: Finding a Better Way, Summary of Findings*, 2001, p.6.

^{xxix} National Center for Education Statistics, *Remedial Education at Degree-Granting Postsecondary Institution sin Fall 2000*. Washington, DC. 2003.

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- ^{xxx} See Deil-Amen, R. and Rosenbaum, J.E. "The Unintended Consequences of Stigma-Free Remediation." *Sociology of Education*, 75(3), 2002, pp. 249-268; Hagedorn, Linda, 2004.
- ^{xxxi} Breneman, David W. and William Haarlow, "Remedial Education: Costs and Consequences." Remediation in Higher Education, Thomas B. Fordham Foundation.
- ^{xxxii} See <http://nces.ed.gov/pubs2001/overview/table05.asp>.
- ^{xxxiii} See, for example, Valerie E Lee and Julia Smith "High School Size: Which Works Best, And for Whom?" Educational Resources Information Center (ERIC), 1996, and ERIC Digest 113, July 1997 "School Size".
- ^{xxxiv} Often cited is James Conant's *The American High School Today* (1959) in which the one-time Harvard president said that schools could get academically stronger if they got larger. However, 'larger' meant 400 students.
- ^{xxxv} See for example: Boyer, Ernest L., *High School*, HarperCollins, 1985, and Sizer, Theodore R., *Horace's School : Redesigning the American High School*, Mariner, 1997 (reprint).
- ^{xxxvi} *One Third of a Nation: Rising Dropout Rates & Declining Opportunities*, Educational Testing Service, February 2005. [http://www.ets.org/Media/Education_Topics/pdf/onethird.pdf]
- ^{xxxvii} Adelman found that intensity and quality of the secondary school curriculum is the best predictor of whether a student will go on to complete a bachelor's degree. See Adelman, C. "Answers in the Tool Box: Academic Intensity, Attendance Patterns, and Bachelor's Degree Attainment." Washington, DC: U.S. Department of Education, 1999. See also Schneider, B. "Strategies for Success: High School and Beyond," Brookings Papers of Education Policy, 2003, pp. 55-93.
- ^{xxxviii} Kirst, M.W. and Venezia, A, Eds. *From High School to College: Improving Opportunities for Success in Postsecondary Education*. San Francisco: Jossey-Bass, 2004.
- ^{xxxix} Education Trust. "Ticket to Nowhere: The Gap Between Leaving High School and Entering College and High-Performance Jobs," in *Thinking K-16*, 3(2). Washington, DC: The Education Trust. Fall 1999. [http://www2.edtrust.org/NR/rdonlyres/1196FBF0-FB01-4B75-B363-B1D525869F29/0/k16_fall99.pdf]
- ^{xl} Venezia, A, Kirst M.W., and Antonio, A. L. "Betraying the College Dream: How Disconnected K-12 and Postsecondary Education Systems Undermine Student Aspirations." The Bridge Project, Stanford University, 2003, p. 3.
- ^{xli} Robertson, P. "Dual Enrollment." *Education Week*. July 13, 2005.
- ^{xlii} Kirst, M.W. and Venezia, A, 2004. Less than 12% of students surveyed knew all the course requirements for college admission.
- ^{xliiii} Rosenbaum, J. E. *Beyond College for All: Career Paths for the Forgotten Half*. New York: Russell Sage Foundation, 2001.
- ^{xliiv} Noel, L, Levitz, R., & Saluri, D., Eds. *Increasing Student Retention*. San Francisco: Jossey-Bass, 1985.
- ^{xli v} Bailey, T.R., Hughes, K.L. and Karp, M.M. "What Role Can Dual Enrollment Programs Play in Easing the Transition between High School and Postsecondary Education?" Community College Research Center, Institute on Education and the Economy, Teachers College, Columbia University, March 2002, p. 2. [<http://www.inpathways.net/dualcredit.pdf>]
- ^{xli vi} See Ronald G. Ehrenberg, *Tuition Rising*, Harvard University Press, 2000.
- ^{xli vii} "The proportion of high school students taking a challenging academic program nearly quadrupled between 1982 and 1994." Coddling and Rothman, 1999, p.3.
- ^{xli viii} Gayler, K., et al. "State High Schools Exit Exams: A Maturing Reform." Center on Education Policy. August 2004. p. 21.
- ^{xli x} New American Schools (NAS) is a public-private partnership formed in the early 1990s with business and philanthropic support. NAS selected eleven "designs" from among almost 700 proposals received from across the country, funding design teams. For a review see Susan Bodilly, *New American Schools' Concept of Break the Mold Designs: How Designs Evolved and Why*, RAND, 2001.
- ⁱ <http://www.ncee.org/acsd/program/high.jsp>
- ⁱⁱ <http://www.csos.jhu.edu/tdhs/about/about.htm>
- ⁱⁱⁱ Berends, M, Bodilly, S.J., and Kirby, S.N. *Facing the Challenges of Whole-School Reform: New American Schools After a Decade*, RAND, 2002.

^{liii} For an overview of charter schools and the evidence on them, see Brewer, Dominic J. and Wohlstetter, Priscilla, "Charter Schools Come of Age" *Urban Education*, forthcoming.

^{liv} A notable example is the "Green Dot" charter high schools sponsored by the Small Schools Alliance. See *Los Angeles Times*, October 10, 2005, "Charter School Crusade Makes waves in L.A", p. B2.

^{lv} At a national level, the difficulty of drawing straightforward conclusions was illustrated by a very public debate over different comparisons using NAEP data. An overview of several studies that reach different conclusions can be found in the EdSource report, "How Are California's Charter Schools Performing?" 2005.

^{lvi} Zimmer, R. et al. *Charter School Operations and Performance: Evidence from California*, RAND, 2003.

^{lvii} How Are California's Charter Schools Performing? EdSource, 2005.

^{lviii} Hoffman, N. and Vargas, J. "Integrating Grades 9 Through 14: State Policies to Support and Sustain Early College High Schools," The Bill & Melinda Gates Foundation: The Early College High School Initiative, January 2005.

^{lix} See [www.earlycolleges.org], "Core Principles" and "The Early College High School Initiative At A Glance". Portraits of some innovative high schools that are part of the initiative may be found in *Rethinking High School: Five Profiles of Innovative Models of Student Success*, by Tracy Huebner and Grace Calisi Corbett, The Bill & Melinda Gates Foundation, 2004.

^{lx} A series of reports prepared for the Bill and Melinda Gates Foundation by the American Institutes of Research and SRI International detail the Early College initiative: "Early College High Schools: Early Recruitment and Selection Strategies" (March 2005); "Early College High School Initiative Evaluation Year End Report: 2003-2004" (March 2005); and "Early College High School Initiative: Intermediary Summary Report, 2003-2004" (December 2004).

^{lxi} See, for example, "Earning Two Diplomas in One", *U.S. News and World Report*, 11/3/03

^{lxii} For example, Bragg (2001) found that at least 65% of participants enrolled in some form of postsecondary education within one to three years after high school graduation. Bragg, D. "Promising Outcomes for Tech Prep Participants in Eight Local Consortia: A Summary of Initial Results," St. Paul, MN: National Research Center for Career and Technical Education, 2001, p.

xi.

^{lxiii} Bailey, T.R., Hughes, K.L. and Karp, M.M. "What Role Can Dual Enrollment Programs Play in Easing the Transition between High School and Postsecondary Education?" Community College Research Center, Institute on Education and the Economy, Teachers College, Columbia University, March 2002, p. 8. [<http://www.inpathways.net/dualcredit.pdf>]

^{lxiv} AP, IB, Tech Prep, Middle College High Schools, and Early College High Schools are all defined along with resource citations in Weiss, Suzanne. "The Progress of Education Reform: Dual Enrollment," 6(3). Education Commission of the States, 2005.

^{lxv} Fajen, A.L. and Prentice, C.M. "Dual Credit Policy: The Missouri Experience." Kaleidoscope Consulting, Policy Issue Brief, 2002.

^{lxvi} Weiss, Suzanne. "The Progress of Education Reform: Dual Enrollment," 6(3). Education Commission of the States, 2005.

^{lxvii} U.S. Department of Education, National Center for Education Statistics, "Dual Credit and Exam-Based Courses in U.S. Public High Schools: 2002-03," NCES 2005-009, by Tiffany Waits, J. Carl Setzer, and Laurie Lewis. Washington, DC: 2005. See also "Dual Enrollment of High School Students at Postsecondary Institutions: 2002-03," NCES 2005-008 by Brian Kleiner and Laurie Lewis. Washington, DC: 2005.

^{lxviii} Boswell, K. State Policy and Postsecondary Enrollment Options: Creating Seamless Systems," *New Directions for Community Colleges*, Spring, 113, p. 7-14.

^{lxix} Colleges can grant college credit IF students end up transferring thereby creating strong incentives for enrollment. There have been several examples of abuse of this practice. For example, granting credit for high school teams' practice sessions by listing it as a college course. See California Community Colleges Chancellor's Office, "First Report to the Legislature On

Status of Systemwide Investigation of College/High School Concurrent Enrollment" (June 6, 2003), p.2. [<http://www.cccco.edu/reports/concurrent.doc>].

^{lxxx} O'Brien, D.M. and Nelson, T.D. "Strengthening College Preparation and Access Through Concurrent Enrollment in High School and Community College," University of Texas, Dallas, 2004.

^{lxxxi} Michelau, D.K., "Postsecondary Enrollment Options Programs," NCSL State Legislative Report, 26(4), April 2001, pp. 3-32.

^{lxxxii} Bailey, T.R. and Karp, M.M. "Promoting College Access and Success: A Review of Credit-Based Transition Programs," Office of Vocational Education, U.S. Department of Education, November 2003.

^{lxxxiii} Bailey, T.R., Hughes, K.L. and Karp, M.M. "What Role Can Dual Enrollment Programs Play in Easing the Transition between High School and Postsecondary Education?" Community College Research Center, Institute on Education and the Economy, Teachers College, Columbia University, March 2002, p. 28. [<http://www.inpathways.net/dualcredit.pdf>]

^{lxxxiv} Fajen, A.L. and Prentice, C.M. "Dual Credit Policy: The Missouri Experience." Kaleidoscope Consulting, Policy Issue Brief, 2002, p. 4.

^{lxxxv} O'Brien, D.M. and Nelson, T.D. "Strengthening College Preparation and Access Through Concurrent Enrollment in High School and Community College," University of Texas, Dallas, 2004.

^{lxxxvi} Martinez, M. and Klopott, S. "How is School Reform Tied to Increasing College Access and Success for Low-Income and Minority?" Institute for Educational Leadership, 2004, p. 34, quoting Clark, R.W., "Dual Credit: A Report of Programs and Policies that Offer High School Students College Credits," Philadelphia, PA: Pew Charitable Trusts, 2001.

^{lxxxvii} There are a handful of other studies based on observations at one institution but because students typically select these programs it is impossible to be certain whether the often reported benefits are artifacts of the program and whether they would be generalizable to other students. For example, Marshall and Andrews (2002) found that at Illinois Valley Community College and Marquette High School stood the test of 16-year period with 500 students successfully participated. "Parents saved \$5000 to \$24,000 in tuition expenses for students completing up to one year of college credit through dual credit" ("Dual Credit Outcomes: A Second Visit" by Marshall, R. and Andrews, H. *Community College Journal of Research and Practice*, 26, 2002, p. 237-242.) Also, Fajen and Prentice (2002) quote Hebert (2001) that among 700 students who took dual enrollment math at their high school received better grades in subsequent coursework who took same dual credit course from college faculty on campus. (See Fajen, A.L. and Prentice, C.M. "Dual Credit Policy: The Missouri Experience." Kaleidoscope Consulting, Policy Issue Brief, 2002). See also Hans A. Andrews, "Dual Credit Research Outcomes For Students", *Community College Journal Of Research And Practice*, 28:415-0422 2004 and Welsh, John, Nick Brake, and Namok Choie, "Student participation and performance in dual credit courses in a reform environment," *Community College Journal Of Research And Practice*, 29: 199-213, 2005.

^{lxxxviii} The state is paying twice for the same students, i.e., "double dipping" into state resources. See Bailey, T.R., Hughes, K.L. and Karp, M.M. "What Role Can Dual Enrollment Programs Play in Easing the Transition between High School and Postsecondary Education?" Community College Research Center, Institute on Education and the Economy, Teachers College, Columbia University, March 2002, p. 23. [<http://www.inpathways.net/dualcredit.pdf>]

^{lxxxix} "According to the Department of Education's 1999-2000 Schools and Staffing Survey, 52 percent of middle school and 15 percent of high school mathematics teachers did not have a major or minor in mathematics and 40 percent of middle school and 11 percent of high school science teachers did not have a major or minor in science." White House Fact Sheet: Jobs for the 21st Century (2004). <http://www.whitehouse.gov/news/releases/2004/01/20040121.html>. In public high schools one third of all math teachers do not even have a college *minor* in the subject. Richard M. Ingersoll, "The Problem of Out Of Field Teaching", *Phi Delta Kappan*, June 1998, p.773.

^{lxxx} Karp, M., Bailey, T., Hughes, K. and Fermin, B. *State Dual Enrollment Policies: Addressing Access and Quality*, U.S. Department of Education, 2004.

^{lxxxii} Hoffman, N. and Vargas, J. *Integrating Grades 9 Through 14: State Policies to Support and Sustain Early College High Schools*, The Bill & Melinda Gates Foundation: The Early College High School Initiative, January 2005. Karp, M., Bailey, T., Hughes, K. and Fermin, B. *State Dual Enrollment Policies: Addressing Access and Quality*, U.S. Department of Education, 2004. See also *Advancing High School reform in the States: Policies and Programs*, Monica Martinez, National Association of Secondary School Principals, 2005.

^{lxxxiii} The six regional associations that accredit public and private schools, colleges, and universities in the United States, typically have different criteria for high schools and postsecondary institutions.