

The Toolbox Revisited: Paths to Degree Completion from High School Through College
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<http://www.ed.gov/rschstat/research/pubs/toolboxrevisit/index.html>

Excerpts from the Executive Summary

The Toolbox Revisited is a data essay that follows a nationally representative cohort of students from high school into postsecondary education, and asks what aspects of their formal schooling contribute to completing a bachelor's degree by their mid-20s. The universe of students is confined to those who attended a four-year college at any time, thus including students who started out in other types of institutions, particularly community colleges.

Curriculum, starting in high school, and continuing

However complex students' attendance patterns, the principal story line leading to degrees is that of content. What one learns is what one studies, and what one brings to economic and community life. The story starts in high school, but merely crossing the bridge to college or community college doesn't mean the story is over. The academic intensity of the student's high school curriculum still counts more than anything else in pre-collegiate history in providing momentum toward completing a bachelor's degree. At the highest level of a 31-level scale describing this academic intensity, one finds students who, through grade 12 in 1992, had accumulated:

3.75 or more Carnegie units of English

3.75 or more Carnegie units of mathematics highest mathematics of either calculus, precalculus, or trigonometry

2.5 or more Carnegie units of science or more than 2.0 Carnegie units of core laboratory science (biology, chemistry, and physics)

more than 2.0 Carnegie Units of foreign languages

more than 2.0 Carnegie Units of history and social studies

1.0 or more Carnegie Units of computer science

more than one Advanced Placement course

no remedial English; no remedial mathematics

These are minimums. In fact, students who reached this level of academic curriculum intensity accumulated much more than these threshold criteria, and 95 percent of these students earned bachelor's degrees (41 also percent earned master's, first professional, or doctoral degrees) by December 2000.

Provided that high schools offer these courses, students are encouraged or required to take them, and, in the case of electives, students choose to take them, just about everybody could accumulate this portfolio. Unfortunately, not all high schools present adequate opportunity-to-learn, and some groups of students are excluded more than others. Latino students, for example, are far less likely to attend high schools offering trigonometry (let alone calculus) than white or Asian students. Students from the lowest

socioeconomic status (SES) quintile attend high schools that are much less likely to offer any math above Algebra 2 than students in the upper SES quintiles. If we are going to close gaps in preparation-and ultimate degree attainment-the provision of curriculum issue has to be addressed. In recent years, colleges and community colleges have begun to provide these courses to high school students, and distance learning provides additional options if students have access to the technology. The hypothetical consequences of participating in curriculum configurations approaching that illustrated above for Latino degree completion rates, in particular, are stunning.

There is a quantitative theme to the curriculum story that illustrates how students cross the bridge onto and through the postsecondary landscape successfully. The highest level of mathematics reached in high school continues to be a key marker in pre-collegiate momentum, with the tipping point of momentum toward a bachelor's degree now firmly above Algebra 2. But in order for that momentum to pay off, earning credits in truly college-level mathematics on the postsecondary side is de rigueur. The world has gone quantitative: business, geography, criminal justice, history, allied health fields-a full range of disciplines and job tasks tells students why math requirements are not just some abstract school exercise. By the end of the second calendar year of enrollment, the gap in credit generation in college-level mathematics between those who eventually earned bachelor's degrees and those who didn't is 71 to 38 percent. In a previous study, the author found the same magnitude of disparity among community college students in relation to earning a terminal associate degree (Adelman 2005a). The math gap is something we definitely have to fix.

A dominant feature of academic histories that cannot really be assessed until the end of the second year following college entry is the extent to which students successfully completed credits in a range of "gateway" courses. It is at this point that the postsecondary curricular story line fully emerges, with ratios of participation in the "gateways" between those who ultimately earned degrees and those who did not running 6:1 in American literature, 4:1 in general chemistry, and more than 3:1 in precalculus, micro/macroeconomics, introduction to philosophy, and world civilization. These gaps in curricular participation argue for academic administrators to identify their key gateway courses and regularly monitor participation.

College and community college expectations for their first-year students in those gateway courses-expressed through examinations, paper and laboratory assignments-need to be more public. Examples such as those offered by the American Diploma Project in its report, *Ready or Not: Creating a High School Diploma That Counts* (2004), should be shared with larger audiences than policymakers and others who habitually read such reports. Parents should see those assignments even if they don't understand them; high school teachers should ponder them to assess whether their exiting students are likely to be prepared; and, most importantly, high school students have got to see them as road signs to their next education destination. *The Tool-box Revisited* advocates making these examples part and parcel of admissions packets, publicity brochures, and Web sites. There is risk in this: Some students may be scared away. But there is no better way to enhance articulation and preparedness than to display what students can expect.