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The Postsecondary Educational Experiences of High School Career and Technical Education Concentrators

Selected Results From the NELS:88/2000 Postsecondary Education Transcript Study (PETS) 2000

E.D. TAB

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Introduction

Students' coursetaking during high school plays a critical role in their ability to transition to postsecondary education and pursue a range of postsecondary majors and degree options. In particular, the importance of academic courses taken during high school is well documented (Adelman 2004a, 1999; Adelman, Daniel, and Berkovits 2003; Horn and Kojaku 2001). For example, research has shown that students who complete a higher level mathematics course in high school are more likely to enroll in a 4-year college, persist through postsecondary education, and earn a bachelor's degree (Adelman, Daniel, and Berkovits 2003; Horn and Kojaku 2001).

Less understood are the associations between high school courses that prepare students for the world of work, now commonly referred to as career and technical education (CTE) courses, and students' postsecondary educational experiences. Since 1990, federal policy has encouraged stronger secondary–postsecondary linkages for high school students who participate in CTE courses. The policies have called upon educators to develop strategies to strengthen academic preparation among these students and to develop tech-prep programs that integrate and articulate secondary and postsecondary curricula (Silverberg et al. 2004).

The purpose of this publication is twofold. First, it presents data on the postsecondary educational experiences of students from the high school class of 1992 who concentrated in CTE while in high school, including information on their postsecondary enrollment, coursetaking, and degree attainment. Second, it demonstrates the richness and unique potential of the dataset analyzed, the National Education Longitudinal Study of 1988 (NELS:88/2000). NELS:88/2000 is one of only two data collections—and the most recent—to have gathered both high school and postsecondary transcripts from a nationally representative sample of students.[1] Other analysts, notably Adelman, have used NELS:88/2000 to examine relations between academic coursetaking in high school and postsecondary experiences (Adelman 2006, 2004b; Adelman, Daniel, and Berkovits 2003). The contribution of this current publication is its focus on high school CTE students and their subsequent educational experiences.

[1] The earlier study, the High School and Beyond/Sophomore Cohort (HS&B:So), collected these two sets of transcripts for a sample of 1982 12th-graders.

Using information from the NELS:88/2000 high school and postsecondary transcripts, this publication presents data to describe

- the proportion of high school CTE concentrators from the class of 1992 who attended college by 2000;
- the types of institutions they first attended;
- their coursetaking patterns at the postsecondary level;
- the proportion of CTE concentrators who earned a postsecondary credential or degree;
- the extent that students who concentrated in CTE in high school pursued the same field at the postsecondary level; and
- whether CTE concentrators who took postsecondary courses related to the career field they studied in high school were more likely to attain a postsecondary degree.

This publication is primarily a collection of tables, with some selected findings highlighted in the text. Standard error tables are included to enable interested readers to perform additional statistical testing. It is important to note that the results highlighted here, and any others that can be calculated from the tables, should not be interpreted as causal or direct relationships. Observed difference may be the result of other factors or variables not controlled for in all analyses. For example, information will be presented to show that CTE concentrators entered high school with lower academic performance than other students. Later tables describe the lower postsecondary attainment rates of CTE concentrators. This publication does not attempt to parse out the potentially independent impacts of lower pre-high school academic performance and high school CTE coursetaking on postsecondary attainment. Rather, it seeks to describe the postsecondary experiences of CTE concentrators, and also provide contextual information about the demographic and pre-high school academic characteristics of these students.

High School and Postsecondary Transcript Data

The National Education Longitudinal Study of 1988 (NELS:88/2000) is a longitudinal study that began in 1988 with a nationally representative sample of 8th-graders in U.S. public and private schools. The cohort was surveyed again in 1990, when most cohort members were in 10th grade; in 1992, when most members were in 12th grade; and in 1994 and 2000, when most members had been out of high school for 2 and 8 years, respectively. Respondents were asked questions about a range of topics across the survey waves, including the grades they earned during middle school (asked in the 8th-grade survey), their postsecondary plans and expectations, extracurricular activities, home experiences, and in later surveys, about employment, earnings, and family formation experiences. The high school transcript data were collected in 1992 and the postsecondary transcript data were collected in 2000. Postsecondary

transcripts were requested for students who participated in the 2000 Fourth Follow-up and reported having attended at least one U.S. postsecondary institution since high school graduation. Other components of the dataset include surveys of students' teachers, parents, and school administrators and achievement data collected through standardized testing. The range and multiple sources of information available through NELS provide many opportunities for researchers to study the link between high school experiences and postsecondary outcomes.

The analysis sample for this publication consists of the NELS:88/2000 respondents who were in 12th grade in 1992 in either a public or private school and for whom complete high school transcripts were collected. Some of the tables further restrict the sample to students who enrolled in a postsecondary institution by 2000, and others further restrict it to those who have complete postsecondary transcripts. Appendix B contains more details about these samples and the analyses undertaken.

High School Curriculum Concentration

For this study, high school curriculum concentration is determined using the Secondary School Taxonomy (SST), developed for the National Center for Education Statistics (NCES), which classifies high school courses into three main curricular areas: academic, career and technical education (CTE), and enrichment/other (see figure 1 at the end of this section). Within the CTE area, courses are classified into general labor market preparation, family and consumer sciences education, and specific labor market preparation.[2] This publication focuses on specific labor market preparation courses that prepare students for a specific occupation or set of related occupations, or for further study of the occupational field at the postsecondary level. Specific labor market preparation courses are classified into 10 broad CTE fields: agriculture and renewable resources, business, marketing, health care, protective and public services, technology and communications, trade and industry, food service and hospitality, child care and education, and personal and other services.

This publication focuses on 12th-grade students in 1992 who concentrated in at least 1 of the 10 identified CTE occupational fields during high school, referring to them as "CTE concentrators." The postsecondary educational experiences of this group are compared with those of students identified in this study as "college preparatory concentrators" and "general education students." The college preparatory concentrators are further classified into three subgroups based on the level and intensity of their academic coursework: those who completed a

[2] General labor market preparation courses teach general employment skills, such as typewriting, word processing, and introductory technology skills. Family and consumer sciences education courses are designed to prepare students for family and consumer roles outside the paid labor market.

core curriculum, a mid-level curriculum, or a rigorous curriculum. The following definitions are used in this publication:

- **CTE concentrators:** Students who earned 3 or more Carnegie units[3] in any one of the 10 specific labor market preparation fields.[4]
- **College preparatory concentrators** include the following three groups:[5]

  Core curriculum: Students who earned 4 Carnegie units in English and 3 each in mathematics, science, and social studies.

  Mid-level curriculum: Students who exceeded the core curriculum by earning at least 2 Carnegie units in foreign language, any units in geometry, and any units in at least two of the following science courses: biology, chemistry, or physics.

  Rigorous curriculum: Students who exceeded the core curriculum by earning 4 Carnegie units in mathematics (including units in precalculus or higher) and 3 each in foreign language and science (including units in biology, chemistry, and physics).

- **Dual CTE and college preparatory concentrators:** Students who completed both a CTE concentration and a college preparatory concentration, as defined above.[6]
- **General education students:** Students who did not meet either the CTE or the college preparatory concentrators criteria.

This publication's focus on students who concentrate in CTE is due, in part, to interest by educators and policymakers in information about the extent to which high school CTE students go on to pursue further training and education at the postsecondary level in a related CTE field (reported in the last set of tables). This requires identifying students' high school CTE fields. In

[3] Carnegie units are a standardized metric for secondary course credits in which 1.0 unit is equivalent to completing a course that meets one period per day for an entire school year.

[4] The CTE concentrator definition used here has been used in previous NCES studies of vocational/technical education, now called "career and technical education" (see, for example, Levesque et al. 2000; Levesque 2003). The previous reports referred to these students as "vocational concentrators" (Levesque et al. 2000) or "occupational concentrators" (Levesque 2003).

[5] The college preparatory categories used here are slight modifications of categories used in a report that studied the relationship between high school academic curricula and the persistence of undergraduates 3 years after entering 4-year institutions (Horn and Kojaku 2001). The definitions in that report were based on three sources: the core curriculum recommended in *A Nation at Risk* as "the New Basics" by the National Commission on Excellence in Education (1983), the high school mathematics course-level analyses of Burkam, Lee, and Smerdon (1996), and Adelman's (1999) research on the effects of secondary school courses taken on postsecondary outcomes. Other researchers have used additional indicators to identify college preparatory students, such as senior class rank, grade point average, and standardized test scores (Berkner and Chavez 1997). However, because the CTE concentrators were identified through coursetaking alone, coursetaking was the only information used to classify students into the other curriculum categories.

[6] In the tables, this group is shown both separately and combined with the group of students who completed only a CTE concentration to form a total group of CTE concentrators. The decision to combine the dual CTE and college preparatory concentrators with the other CTE concentrators, rather than with the other college preparatory concentrators, reflects this publication's focus on CTE concentrators rather than on college preparatory concentrators.

this publication and previous NCES and National Assessment of Vocational Education reports, this is done by identifying students who completed at least 3 units in one CTE field (Silverberg et al. 2004; Levesque 2003; Levesque et al. 2000). Other analysts might choose different definitions, offering an example that a student who wants to manage a farm may take two agricultural courses, an accounting course, and a marketing course, and may be a purposeful concentrator. However, it would be impossible to identify all possible combinations of CTE courses that might reflect a thoughtful CTE program of study. Thus, this report adopts the definition of CTE concentrators that has been used in other reports, while acknowledging that it does not capture all students who may have focused on a CTE field while in high school.[7]

Another limitation of the data is that students started high school in 1988, before the Carl D. Perkins Vocational and Applied Technology Act Amendments of 1990 and the School-to-Work Opportunities Act of 1994 encouraged stronger secondary–postsecondary linkages for high school students who participate in CTE courses (Silverberg et al. 2004). The next large-scale national study that will collect both high school and postsecondary transcripts is the Education Longitudinal Study (ELS), which gathered high school transcripts in 2004 and is scheduled to collect postsecondary transcripts in 2012.

It is also important to point out that these data do not contain information on program quality. Some high school CTE programs are aligned with external credentialing agencies and are formally linked to postsecondary programs where students can acquire additional certifications and credentials. It is likely that high-quality high school CTE programs that provide rigorous technical training and help students connect to postsecondary programs would be associated with higher proportions of students entering postsecondary education. The NELS data do not contain this information, and in the late 1980s and early 1990s when these students were in high school, it is possible that fewer such programs existed than do today. Thus, the estimates presented here may underestimate the postsecondary experiences of CTE concentrators who completed high school in the late 1990s and early 2000s.

Postsecondary Educational Experiences

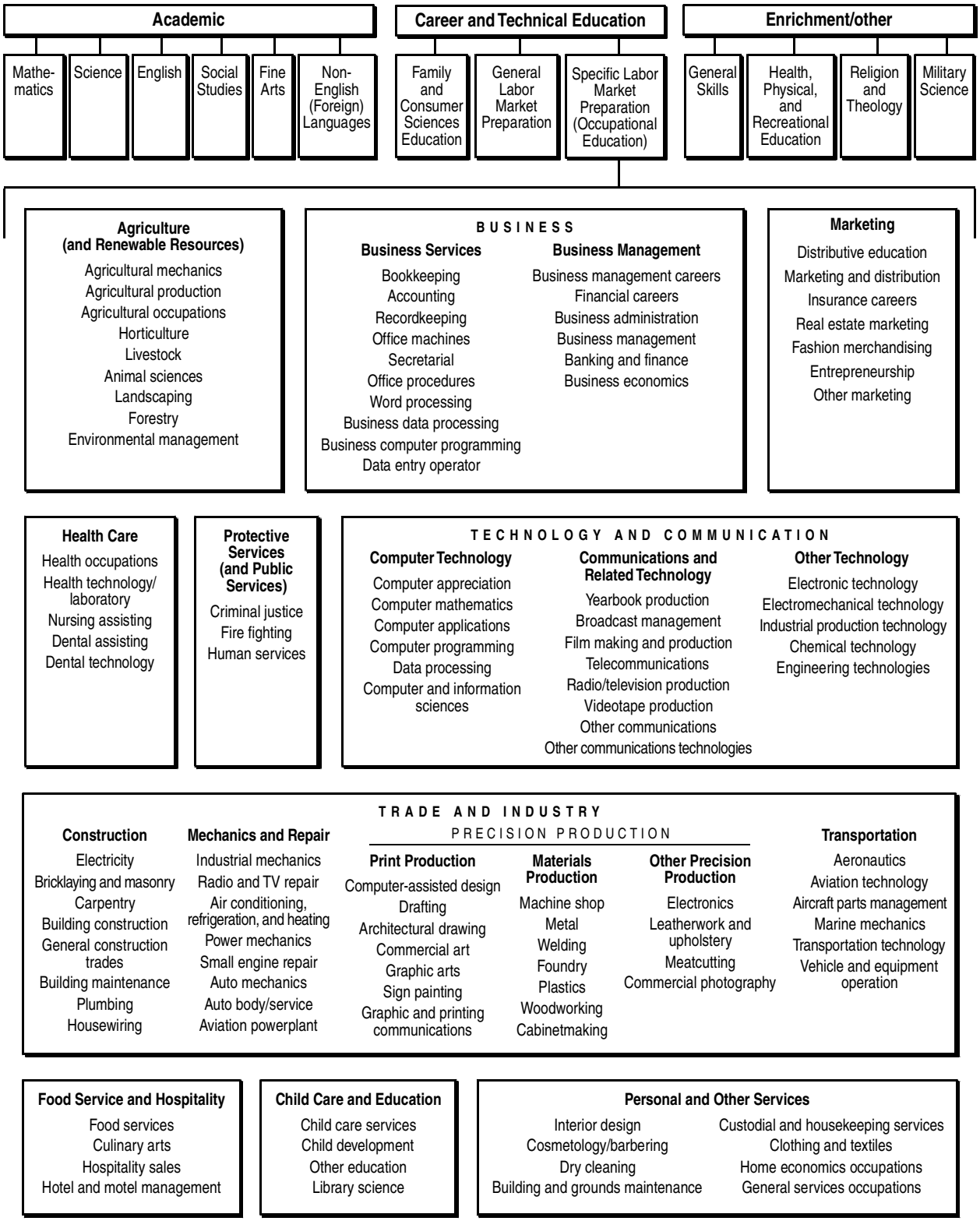
This publication presents data on a range of postsecondary experiences, with information provided for each curriculum concentration group listed above. The postsecondary information includes the following:

[7] Exploratory analyses were conducted to consider other definitions, such as at least 4 CTE credits with at least 2 coming from one CTE field. Those analyses revealed only 4 percent of students took 4 or more CTE credits without also being a CTE concentrator (i.e., with 3 of those credits in one field), and only 1 percent took 5 or more CTE credits without also being a CTE concentrator. Thus, while the definition of CTE concentrator in this report may be conservative, it appears that it captures the majority of students who studied a CTE field in depth in high school.

- Percentage of students who enrolled in any postsecondary education by 2000;
- Time elapsed between students' graduation from high school and their first enrollment in college;
- Type of institution in which students first enrolled (4-year, community college, and other);
- Undergraduate credits earned (total, academic, and career-related);
- Postsecondary credits earned in a related career field;
- Highest postsecondary credential earned (certificate, associate's degree, bachelor's or higher degree);
- Field of postsecondary credential; and
- Postsecondary credential earned in a field related to high school concentration field.

A glossary of the NELS:88/2000 variables used in this publication is provided in appendix A.

Figure 1. Secondary School Taxonomy



SOURCE: Adapted from Bradby, D. and Hoachlander, E.G. (1999). *1998 Revision of the Secondary School Taxonomy* (NCES 1999–06). U.S. Department of Education. Washington, DC: National Center for Education Statistics Working Paper.

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Selected Findings

This section presents selected findings from the analysis, focusing on career and technical education (CTE) concentrators and comparing this group with college preparatory concentrators and general education students. Because the focus is on CTE concentrators, students who completed a dual CTE and college preparatory concentration are grouped with the "CTE only" concentrator category to form a "CTE (total)" concentrator group, and are also shown separately in the tables. Although the tables include information for college preparatory students at each of the three levels of rigor, this discussion of selected findings mostly refers to the total group of "college preparatory only" concentrators (i.e., those who did not also complete a CTE concentration). All differences noted here are statistically significant at the $p \leq .05$ level based on two-tailed *t*-tests. Standard error tables are included in appendix D to enable readers to conduct additional comparisons not specifically addressed in this section.

What percentage of students completed each high school curriculum?

- About one in five students (21 percent) from the senior class of 1992 were CTE concentrators (table 1). Of those students, roughly one-quarter (26 percent) were dual concentrators, completing both a CTE and college preparatory curriculum. Dual CTE and college preparatory concentrators make up 6 percent of the total 12th-grade class of 1992.
- About 38 percent of all 12th-grade students were exclusively college preparatory concentrators (i.e., college preparatory only concentrators) (table 1). This group is further broken down into three subgroups by the level and intensity of their academic coursework. The majority of the college preparatory only concentrators (61 percent) completed a mid-level academic curriculum, while 23 percent took just the core curriculum, and 16 percent completed the rigorous course of study.
- Students who completed dual CTE and college preparatory concentrations tended to complete a less rigorous academic program than students who were college preparatory only concentrators. Specifically, the former group of students were more likely to have finished just the core curriculum (46 vs. 23 percent) and less likely to have completed the mid-level (50 vs. 61 percent) or the rigorous curriculum (5 vs. 16 percent) (table 1).
- About 4 in 10 students (41 percent) had a general education preparation—that is, they did not complete either a college preparatory or a CTE concentration (table 1).

What career fields did CTE concentrators study during high school?

- Trade and industry, business, and agriculture and natural resources were the top three fields for CTE concentrators: a total of 82 percent of all CTE concentrators were in one of these fields (table 2). Public and protective services, food service and hospitality, child care and education, and health care were the least common fields, each containing 2 percent or fewer of all the CTE concentrators.
- There were some differences in the types of fields studied by students who completed only a CTE concentration and those who completed dual CTE and college preparatory concentrations (table 2). The CTE only concentrators were more likely to concentrate in trade and industry (table 2), personal and other services, food service and hospitality, and child care and education, while dual CTE and college preparatory concentrators were more likely to concentrate in business and technology and communications.

What were the demographic and previous academic characteristics of CTE concentrators?

To provide context for later tables which describe students' post-high school experiences, demographic and pre-high school academic information for each high school concentration group is presented in tables 3-A and 3-B. As will be detailed, the groups differed on a number of characteristics before they entered high school. This highlights the importance of not making direct causal inferences about the associations between high school concentration and postsecondary experiences.

- About 6 of 10 CTE concentrators were males (table 3-A). While CTE students were more likely to be male, college preparatory students were more likely to be female. There were no measurable gender differences among general education students.
- About three-quarters of CTE concentrators were White, 10 percent were Black, 10 percent were Hispanics, and smaller proportions were Asians/Pacific Islanders or American Indians/Alaska Natives (table 3-A). This racial/ethnic distribution was consistent with the racial/ethnic distribution of all 12th-grade students in 1992, and with students who completed a college preparatory curriculum. In comparison with general education students, a larger proportion of CTE concentrators were White, and a smaller proportion were Hispanic.
- Students who completed a CTE concentration in high school came from lower socioeconomic family backgrounds than both college preparatory and general education students (table 3-A).[8]
- Before completing a CTE concentration, these students entered high school with weaker academic preparation than college preparatory and general education students,

[8] Socioeconomic status is based on information collected from parents when students were in 8th grade, including father's education level, mother's education level, father's occupation, mother's occupation, and family income.

as measured by scores on 8th-grade reading and mathematics standardized tests (table 3-B).[9] While 23 percent of CTE concentrators scored in the bottom quartile on the 8th-grade test, 8 percent of college preparatory students fell into this range. At the other end of the scale, 18 percent of CTE concentrators scored in the highest quartile, compared with 47 percent of college preparatory and 28 percent of general education students.

- In the spring of 8th grade, students who went on to concentrate in CTE in high school reported earning lower grades than students who went on to complete a college preparatory curriculum (i.e., a lower proportion of CTE concentrators reported earning "mostly As," while higher proportions reported earning "Mostly Bs," "Mostly Cs," and "Mostly Ds") (table 3-B).[10] There were no measurable differences in self-reported pre-high school grades between CTE concentrators and general education students.

What was the level of mathematics preparation during high school among CTE concentrators?

The level of mathematics courses that students complete during high school is associated with a number of postsecondary experiences. Students who take advanced mathematics courses during high school are more likely to enroll in a 4-year college, less likely to take remedial mathematics courses in college, more likely to earn any postsecondary degree or certificate, and are specifically more likely to earn a bachelor's degree (Adelman, Daniel, and Berkovits 2003).

Although mathematics coursetaking during high school was one of the indicators used to classify students into the curriculum categories, it is nevertheless informative to examine the percentage of students in each group who completed various levels of mathematics courses. Information on the highest level of mathematics course in which students earned any credits during high school is presented in table 4.

- Students who completed only a CTE concentration had the lowest level of mathematics coursetaking of all the curriculum groups (table 4). These students were more likely to have only reached the first two levels of mathematics coursetaking ("other or no math" and algebra I). The CTE only concentrators were also the least likely to have completed advanced courses such as trigonometry, precalculus, and calculus.

- A greater percentage of dual CTE and college preparatory concentrators completed precalculus or calculus compared with the college preparatory only concentrators who

[9] Assessment scores were based on students' performance on 8th-grade reading and mathematics standardized tests. Composite scores were standardized and broken into quartiles. The distribution is different in grade 12 due to high school dropouts.

[10] The variable for pre-high school grades is based on an average of self-reported grades in four subject areas (English, mathematics, science, and social studies) during grades 6 though 8.

completed the core curriculum (22 vs. 11 percent) (table 4). The dual CTE and college preparatory concentrators were less likely, however, than the college preparatory only mid-level students (32 percent) and college preparatory only rigorous students (100 percent) to have taken these advanced courses.

What percentage of CTE concentrators enrolled in college? How soon after high school graduation did they enroll, and what types of postsecondary institutions did they enter?

- By 2000, the majority of CTE concentrators from the class of 1992 had enrolled in postsecondary education (65 percent of the total group of CTE concentrators, 59 percent of the CTE only subgroup, and 82 percent of the dual CTE and college preparatory subgroup) (table 5). Nevertheless, among all of the curriculum groups, enrollment rates were lowest for students who completed only a CTE concentration.
- About three-quarters of all CTE concentrators who enrolled in a postsecondary institution did so within 7 months of their high school graduation (table 5). This immediate transition rate was not measurably different from the rate for general education students, but was lower than the rate for students who completed a college preparatory curriculum only.
- More than half (56 percent) of all CTE concentrators began their postsecondary education at a community college (table 5), while 37 percent began at a 4-year institution, and 7 percent at another type of institution. CTE students were less likely than college preparatory only students to initially matriculate into a 4-year college and were more likely to first enter a community college or another type of institution. CTE concentrators were less likely than general education students to begin their postsecondary education at a 4-year college.

What did students who concentrated in CTE during high school study at the postsecondary level?

The next set of tables (tables 6–8) presents information about undergraduate credits earned by students from each high school curriculum group. Table 6 reports on total undergraduate credits, academic credits, and career-related credits. “Academic credits” are defined as those earned in the traditional liberal arts and science fields (i.e., English/letters, humanities, social sciences, fine and performing arts, and liberal studies), while “career-related credits” are defined as those earned in fields associated with occupations, such as engineering, education, and health (Hudson and Shafer 2004). Later tables in this publication consider the extent to which high school CTE concentrators continued to study the same career field at the postsecondary level (see tables 13–15). Therefore, career-related postsecondary courses are grouped in a manner consistent with their categorization at the secondary level (see figure 1). In other words, this publication takes the perspective of the high school CTE curriculum and maps related postsecondary courses onto this structure. This mapping is only one of a number of possible

approaches for identifying related postsecondary courses, and likely the most conservative approach. See appendixes B and C for more details on the classification of credits (and majors) into academic and career-related fields.

Tables 6 through 8 present credit attainment information overall and separately by the type of institution in which students first enrolled (4-year institutions and community colleges). Small sample size prohibited reporting data separately for students who initially entered "other" types of institutions. The columns in table 6 that present information on the percentage of total credits that are academic and the percentage that are career-related are average percentages. That is, the ratios of academic to total credits, and of career-related to total credits, were computed for each student, and the average of those values was then estimated.

- Among 12th-grade students in 1992 who subsequently enrolled in any type of postsecondary institution, the total group of CTE concentrators, on average, earned fewer total, academic, and career-related undergraduate credits than the college preparatory only group (table 6). As mentioned in the introduction of this report, it is important not to assume causality, or direct relationships, in these findings. Factors other than being a CTE concentrator, such as timing of entry, degree goals, or enrollment intensity, may play a role in this relationship.
- Although CTE concentrators earned fewer total, academic, and career-related credits, a greater proportion of their credits were in career-related courses compared with college preparatory only concentrators (49 vs. 35 percent) (table 6). These patterns of fewer total, academic, and career-related credits, but a greater proportion of career-related credits among CTE concentrators, were also generally observed among students who initially enrolled in a 4-year institution and among those who started at a community college. The one exception was that there was no measurable difference in the average number of career-related credits earned by CTE concentrators and the college preparatory only group who started their postsecondary education at a 4-year institution.
- Among students who participated in postsecondary education, irrespective of the type of institution first attended, CTE concentrators earned fewer total and academic undergraduate credits than did general education students, but more career-related credits (table 6). Accordingly, the proportion of undergraduate credits from career-related courses was greater among CTE concentrators than among general education students (49 vs. 40 percent).
- Comparisons of credit attainment between CTE concentrators and general education students varied somewhat depending on the type of institution at which students began their postsecondary education. Among students who first entered 4-year institutions, CTE concentrators earned fewer academic credits and a greater proportion of their credits were in career-related fields compared with general education students, but there were no measurable differences in total number of undergraduate credits or the number of career-related courses earned by these two groups. Among those who

started at community colleges, there was no measurable difference in the total credits earned by these two groups, but CTE concentrators earned more career-related credits and fewer academic credits than did general education students. Thus, CTE concentrators who started community colleges, like their peers who started at 4-year institutions, earned a higher proportion of their credits in career-related fields than did general education students.

- Nine percent of CTE concentrators who enrolled in a postsecondary institution were "incidental students," a term developed by Adelman (1995) to describe those who earned 10 or fewer total postsecondary credits (table 6). This rate was higher than the rate for college preparatory only concentrators (1 percent), but not measurably different from the rate for general education students.
- Information on postsecondary credits earned in specific career-related fields is presented in tables 7 and 8. With the exception of students who completed a rigorous college preparatory curriculum only, more than half of postsecondary education participants from the other high school curriculum groups earned postsecondary credits in the field of business (table 7). In addition, at least 50 percent of students in each of the high school concentration subgroups who participated in postsecondary education earned undergraduate credits in communications and related technology.[11]
- Across each of the high school curriculum groups, the percentage of students earning postsecondary credits in personal and other services, and in food service and hospitality, was small (ranging from 1 to 3 percent) (table 7).
- High school CTE concentrators were less likely than the college preparatory only group to have taken a course in the following career-related fields: agriculture, marketing, communications and related technology, education and child care, health care, and public and protective services (table 7). There were no measurable differences in the proportion of CTE concentrators and college preparatory only concentrators who took a course in business, computer science, engineering and related technology, personal and other services, trade and industry, and food service and hospitality. There were no career-related fields in which a greater proportion of CTE concentrators took a course compared with college preparatory only concentrators.
- CTE concentrators were more likely than general education students to have earned credits in business and engineering and related technology, but less likely to have earned credits in communications and related technology, education and child care, and health care (table 7).

[11] At the secondary level, the Secondary School Taxonomy (SST) identifies a broad CTE field of "technology and communications" consisting of three subfields: computer technology, communications and related technology, and "other technology." Because these subfields appeared to diverge at the postsecondary level, the subfields were analyzed separately. Please see appendix B for more details.

What proportion of CTE concentrators who enrolled in a postsecondary institution earned a postsecondary certificate or degree?

- Among the total group of CTE concentrators from the class of 1992 who enrolled in a postsecondary institution, about half earned a postsecondary certificate or degree by 2000, while about one-quarter (26 percent) earned a bachelor's or higher degree (table 9). Dual CTE college preparatory concentrators were more likely than CTE only concentrators to have earned any postsecondary certificate or degree (63 vs. 44 percent), and more likely to have earned a bachelor's degree (45 vs. 16 percent), but less likely to have earned a certificate as their highest degree (4 vs. 10 percent).
- A higher proportion of college preparatory only students earned a postsecondary certificate or degree than both the total group of CTE concentrators and the subgroup of dual CTE and college preparatory concentrators (table 9). College preparatory only students were less likely to have an associate's degree as their highest postsecondary degree than CTE only concentrators, and more likely to have earned a bachelor's or advanced degree than both the total group of CTE concentrators and the subgroup of dual concentrators.
- Comparing the total group of CTE concentrators with general education students, there was no detectable difference in the proportion who earned a postsecondary certificate or degree (table 9), but CTE concentrators were more likely to have earned an associate's degree as their highest degree, and less likely to have earned a bachelor's or advanced degree by 2000.
- About 6 percent of the total group of CTE concentrators had not earned a postsecondary certificate or degree by 2000 but were still enrolled in postsecondary education, while 43 percent had not earned a postsecondary credential and were not enrolled (table 9).

In what fields did CTE concentrators earn degrees?

Tables 10 through 12 present information about the fields in which students earned postsecondary certificates and degrees. As with the postsecondary coursetaking analyses, majors were classified as either academic or career-related (see appendixes A and B, and table C-2 in appendix C, for more information on the classification of postsecondary majors).

- The postsecondary certificates earned by the high school class of 1992 were almost exclusively in career-related fields (between 98 and 100 percent) (table 10).[12] Among the total group of CTE concentrators who earned a postsecondary certificate, the most common field was trade and industry, with 42 percent of students who earned a certificate having done so in this field. The two other most common fields were business and health care, although there was no measurable difference in the

[12] Because only 1 percent of students earned a certificate in an academic field, information about specific academic fields is not presented for this group.

proportion of CTE concentrators who earned a certificate in health and the proportion who earned a certificate in food services and hospitality.

- Almost two-thirds (64 percent) of the total group of CTE concentrators from the high school class of 1992 who earned an associate's degree by 2000 majored in a career-related field (table 11-B). In addition, 60 percent of college preparatory concentrators only and 53 percent of general education students who completed an associate's degree also majored in a career-related field. There were no measurable differences in these rates for the three main curriculum groups. In terms of specific career fields, CTE concentrators were more likely to have earned an associate's degree in business than college preparatory only and general education students. CTE concentrators were less likely to have earned an associate's degree in health care than college preparatory only concentrators, and more likely to have earned an associate's degree in engineering and related technologies than general education students.
- Career-related majors were also common among high school CTE concentrators who earned a bachelor's degree: about 70 percent of the total group of CTE concentrators and both subgroups of CTE concentrators majored in a career-related field for their bachelor's degree (table 12-B). This rate was higher than the rates for college preparatory only (54 percent) and general education students (55 percent) who earned a bachelor's degree. For each of the three main high school curriculum groups, the most common career-related major was business. There was one exception to this pattern, however: among general education students, the percentage who earned a bachelor's degree in business was not measurably different from the percentage of students who earned a degree in health.

To what extent did high school CTE concentrators study the same career field at the postsecondary level?

The last set of tables (tables 13–15) present data that describe the extent to which students who concentrated in CTE during high school continued to study the same career field at the postsecondary level. This coursework is referred to as "core-related" postsecondary coursework. Depending on the degree level, students pursuing the same career field at the postsecondary level are also likely to have specific academic requirements for that major, or requirements for courses in other career fields. For example, a student who concentrated in agriculture in high school may go on to major in forestry (classified as agricultural/natural resources career field). Along with forestry core courses, the student may be required to take biology courses (classified as academic) and a public administration course (classified as public and protective services). In this report, the forestry courses are considered core-related courses, while the others are not. This is primarily due to the difficulty, or impossibility, of capturing all courses that could conceivably be related to each CTE field. Nevertheless, if the example student above who concentrated in agriculture in high school did not take any agricultural courses at the postsecondary level, it would be difficult to claim the student pursued the same field at the

postsecondary level. The approach taken in this report of focusing on core-related coursework likely produces the most conservative estimates of relatedness.

To identify core-related coursework, this publication took the framework for classifying secondary CTE courses (figure 1), and mapped postsecondary courses and degrees onto this framework. See appendix B for additional information about how postsecondary courses and majors were identified as related to the 10 broad high school CTE fields. See appendix C for crosswalks of CTE fields and related postsecondary courses and majors. In addition, the glossary (appendix A) contains the related postsecondary course aggregates and majors associated with each high school CTE field.

- About half (52 percent) of CTE concentrators who enrolled in a postsecondary institution earned postsecondary credits in a related field (table 13). About one-quarter (27 percent) earned 12 or more credits in a related field, roughly the equivalent of one semester of full-time postsecondary study.
- Among students who concentrated in a specific CTE field for which there are enough cases to produce a reliable estimate, those who concentrated in business during high school were the most likely of all the CTE concentrators to earn any core-related postsecondary credits (76 percent) and to earn 12 or more such credits at the postsecondary level (42 percent) (table 13). Twenty-six percent of technology and communications concentrators and 47 percent of trade and industry concentrators also earned core-related postsecondary credits.
- Overall, 32 percent of CTE concentrators who earned a postsecondary degree or certificate did so in a related field (table 14). There were no measurable differences between this overall rate for CTE concentrators and the rates for concentrators in specific fields for which there are adequate data.
- Table 15 compares postsecondary attainment and persistence rates for CTE concentrators who enrolled in postsecondary education by the number of core-related postsecondary credits they earned. CTE concentrators who completed any core-related postsecondary coursework were more likely to have earned any postsecondary certificate or degree (60 vs. 40 percent), and more likely to have earned a bachelor's degree (30 vs. 21 percent), than CTE concentrators who took no core-related postsecondary coursework. CTE concentrators who took any core-related postsecondary coursework were less likely to have been an "incidental student" (earned 10 or fewer credits) than those who took none. Among CTE concentrators who earned core-related postsecondary credits, those who earned 13 or more core-related credits were generally more likely to have earned a postsecondary certificate or degree, with the exception that the difference in postsecondary attainment rates for CTE concentrators earning 13 or more core-related credits and those earning 4 to 6 such credits was not statistically significant. Again, it is important to warn against making causal inferences from these findings. The positive associations between the number of core-related postsecondary core credits and earning a certificate or degree may reflect students who take core-related courses being more interested and engaged in their

schooling, and therefore more likely to persist and earn a degree, or may reflect students who have more opportunity to take core-related courses.

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Tables

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Table 1. Percentage distributions of 1992 12th-grade students, by high school curriculum concentration for total group of students, for career and technical education (CTE) concentrators, and for college preparatory concentrators

High school concentration	All students	Career and technical education (CTE) concentrators	College preparatory concentrators
Total	100.0	†	†
Career and technical education (CTE), total	21.4	100.0	†
CTE only	15.8	73.9	†
Dual CTE and college preparatory	5.6	26.1	100.0
Core curriculum	2.5	†	45.5
Mid-level curriculum	2.8	†	49.8
Rigorous curriculum	0.3	†	4.8
College preparatory only	38.0	†	100.0
Core curriculum	8.9	†	23.4
Mid-level curriculum	23.2	†	61.0
Rigorous curriculum	5.9	†	15.6
General education	40.6	†	†

† Not applicable.

NOTE: This table includes 1992 12th-grade students who had complete high school transcripts. CTE concentrators are students who earned at least 3 Carnegie units in any one of the 10 specific labor market preparation fields (see figure 1). College preparatory concentrators include three groups of students: those who earned 4 Carnegie units in English, science, and social studies (the core curriculum); students who exceeded the core curriculum by earning at least 2 Carnegie units in foreign language, any units in geometry, and any units in at least two of the following science courses: biology, chemistry, or physics (mid-level curriculum); and students who exceeded the core curriculum by earning 4 Carnegie units of mathematics and 3 each in foreign language and science, including units in biology, chemistry, and physics (rigorous curriculum). Dual CTE and college preparatory concentrators are students who completed a CTE concentration and a college preparatory concentration. General education students are those who did not meet either the CTE or the college criteria. Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/92), "Second Follow-up, High School Transcript Survey, 1992" and National Education Longitudinal Study of 1988 (NELS:88/2000), "Fourth Follow-up, Postsecondary Education Transcript Survey, 2000."

Table 2. Percentage distribution of 1992 12th-grade students who were career and technical education (CTE) concentrators, by CTE field

CTE field	Total	CTE concentrators only	Dual CTE and college preparatory concentrators
Total	100.0	100.0	100.0
Agriculture and natural resources	9.6	9.9	8.7
Business	30.7	27.2	40.5
Marketing	4.3	4.3	4.3
Health care	1.7	1.9	1.1
Public and protective services	0.1	0.1	0.3
Trade and industry	41.5	44.0	34.3
Technology and communications	5.3	4.0	8.9
Personal and other services	4.2	5.4	1.1
Food service and hospitality	1.1	1.4	0.3
Child care and education	1.5	1.8	0.5

NOTE: This table includes 1992 12th-grade career and technical education concentrators who had complete high school transcripts. See table 1 for the definition of CTE concentrators. Detail may not sum to totals because of rounding.
SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/92), "Second Follow-up, High School Transcript Survey, 1992" and National Education Longitudinal Study of 1988 (NELS:88/2000), "Fourth Follow-up, Postsecondary Education Transcript Survey, 2000."

Table 3-A. Percentage of 1992 12th-grade students with selected demographic characteristics, by high school curriculum concentration

			Race/ethnicity[1]							
	Sex							Socioeconomic status[2]		
High school concentration	Male	Female	White	Black	Hispanic	Asian/ Pacific Islander	American Indian or Alaska Native	Low	Middle	High
Total	50.2	49.8	71.8	12.1	10.0	4.3	1.7	18.9	50.5	30.6
Career and technical education (CTE), total	58.5	41.5	74.6	11.3	9.1	4.0	1.0	30.7	56.2	13.1
CTE only	57.6	42.4	72.7	11.9	10.4	4.0	1.0	34.4	56.3	9.3
Dual CTE and college preparatory	60.9	39.1	79.9	9.5	5.2	4.3	1.1	20.0	55.7	24.3
College preparatory only	46.8	53.2	75.2	11.6	6.9	4.8	1.5	10.2	45.2	44.6
Core curriculum	56.4	43.6	67.9	12.7	11.2	2.7	5.5	18.0	51.0	31.0
Middle-level curriculum	42.1	57.9	76.5	12.9	6.0	4.3	0.4	8.8	46.2	45.0
Rigorous curriculum	50.4	49.6	81.0	5.2	3.8	10.0	#	3.8	32.1	64.1
General education	49.2	50.8	67.3	12.9	13.5	4.0	2.3	21.5	52.8	25.7

Rounds to zero.

[1] Black includes African American and Pacific Islander includes Native Hawaiian. Race categories exclude Hispanic origin unless specified.

[2] Socioeconomic status is based on information collected when students were in 8th grade, including father's education level, mother's education level, father's occupation, mother's occupation, and family income. Values were transformed into quartiles. Low is defined as the bottom quartile, middle is defined as the middle two quartiles, and high is defined as the top quartile. The distribution is different in grade 12 due to high school dropouts.

NOTE: See table 1 for high school concentration definitions.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/92), "Second Follow-up, High School Transcript Survey, 1992" and National Education Longitudinal Study of 1988 (NELS:88/2000), "Fourth Follow-up, Postsecondary Education Transcript Survey, 2000."

Table 3-B. Percentage of 1992 12th-grade students with selected pre-high school academic characteristics, by high school curriculum concentration

	8th-grade reading/mathematics composite scores[1]			Grades from 6th through 8th grade[2]			
High school concentration	Low quartile	Middle two quartiles	High quartile	Mostly As	Mostly Bs	Mostly Cs	Mostly Ds
Total	15.8	51.0	33.2	34.5	47.3	16.7	1.4
Career and technical education (CTE), total	22.8	58.9	18.3	23.4	52.1	21.9	2.5
CTE only	26.3	60.5	13.2	17.1	54.9	24.7	3.3
Dual CTE and college preparatory	12.6	54.2	33.3	42.2	43.9	13.6	0.4
College preparatory only	7.8	45.6	46.6	49.8	40.5	9.4	0.4
Core curriculum	16.6	59.4	24.0	25.7	51.3	21.7	1.3
Middle-level curriculum	6.3	45.4	48.4	52.7	40.2	7.0	0.1
Rigorous curriculum	0.2	24.3	75.5	75.1	24.4	0.5	#
General education	20.1	52.3	27.6	25.0	51.7	21.3	1.9

Rounds to zero.

[1] Assessment scores were based on students' performance on 8th-grade reading and mathematics standardized tests. Composite scores were standardized and broken into quartiles. The distribution is different in grade 12 due to high school dropouts.

[2] This variable is based on an average of self-reported grades in four subject areas (English, mathematics, science, and social studies) during grades 6 through 8.

NOTE: See table 1 for high school concentration definitions.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/92), "Second Follow-up, High School Transcript Survey, 1992" and National Education Longitudinal Study of 1988 (NELS:88/2000), "Fourth Follow-up, Postsecondary Education Transcript Survey, 2000."

Table 4. Percentage distribution of 1992 12th-grade students according to highest level of mathematics completed in high school, by high school curriculum concentration

High school concentration	Other or no math	Algebra I	Geometry	Algebra II	Trigo-nometry	Calculus or pre-calculus
Total	6.9	15.9	15.0	29.5	12.1	20.5
Career and technical education (CTE), total	14.3	25.0	17.8	27.2	7.5	8.1
CTE only	18.0	31.4	20.4	24.0	2.8	3.3
Dual CTE and college preparatory	3.6	6.8	10.5	36.2	21.0	21.8
College preparatory only	0.5	3.3	6.9	33.2	18.6	37.5
Core curriculum	2.3	14.0	14.8	41.4	16.4	11.1
Middle-level curriculum	#	#	5.6	38.6	24.3	31.5
Rigorous curriculum	#	#	#	#	#	100.0
General education	9.1	23.0	21.2	27.2	8.3	11.3

Rounds to zero.

NOTE: This table includes 1992 12th-grade students who had complete high school transcripts. See table 1 for high school concentration definitions. Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/92), "Second Follow-up, High School Transcript Survey, 1992" and National Education Longitudinal Study of 1988 (NELS:88/2000), "Fourth Follow-up, Postsecondary Education Transcript Survey, 2000."

Table 5. Percentage of 1992 12th-grade students who enrolled in postsecondary education between 1992 and 2000, and among those enrolled, percentage distribution of the elapsed time between high school graduation and postsecondary enrollment and the type of first institution enrolled, by high school curriculum concentration

		Among those enrolled					
		Time between high school graduation and postsecondary enrollment			Type of first institution enrolled		
High school concentration	Percentage of students who enrolled[1]	Entered within 7 months	Delayed 8–20 months	Delayed 20 months or more	4-year	Community college	Other[2]
Total	76.7	84.8	7.9	7.3	56.5	39.0	4.5
Career and technical education (CTE), total	64.7	75.2	12.3	12.5	37.1	56.1	6.8
CTE only	58.5	69.1	14.8	16.1	26.9	65.2	7.9
Dual CTE and college preparatory	82.2	87.6	7.2	5.3	58.0	37.4	4.6
College preparatory only	91.8	93.0	4.0	3.0	74.1	23.8	2.1
Core curriculum	85.1	86.5	7.1	6.4	54.2	41.7	4.2
Middle-level curriculum	93.4	93.6	3.8	2.6	75.0	23.1	1.9
Rigorous curriculum	95.3	98.5	0.8	0.7	94.2	5.1	0.7
General education	68.9	79.4	10.6	10.0	43.6	50.1	6.3

[1] These students are known as postsecondary participants. Please see appendix A for details.

[2] Other types of institutions include private 2-year, public and private less-than-2-year, and unclassified institutions.

NOTE: The first column of this table includes 1992 12th-grade students who had complete high school transcripts. The remaining columns are further limited to students with complete postsecondary transcripts. See table 1 for high school concentration definitions. Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/92), "Second Follow-up, High School Transcript Survey, 1992" and National Education Longitudinal Study of 1988 (NELS:88/2000), "Fourth Follow-up, Postsecondary Education Transcript Survey, 2000."

Table 6. Undergraduate total, academic, and career-related credits earned as of 2000 by 1992 12th-grade students who enrolled in postsecondary education between 1992 and 2000, by high school curriculum concentration and institution type

	Total undergraduate credits				Undergraduate academic credits					Undergraduate career-related credits				
		Percentage distribution				Percentage distribution					Percentage distribution			
High school concentration	Mean	0–10	11–59	60 or more	Mean	0–10	11–59	60 or more	Percent of total credits[1]	Mean	0–10	11–59	60 or more	Percent of total credits[1]
Total	100.2	4.7	24.1	71.2	62.5	13.7	34.9	51.4	60.5	37.7	25.9	48.0	26.1	39.5
Career and technical education (CTE), total	77.6	9.3	35.7	55.0	41.2	26.1	45.0	28.9	50.7	36.4	26.5	48.6	24.8	49.3
CTE only	67.4	12.4	39.9	47.6	34.3	33.9	45.4	20.7	47.3	33.1	29.5	50.4	20.1	52.7
Dual CTE and college preparatory	98.2	3.0	27.2	69.8	55.2	10.4	44.2	45.4	57.3	43.0	20.6	45.0	34.3	42.7
College preparatory only	120.3	1.4	12.4	86.2	77.9	4.7	27.8	67.4	65.2	42.4	20.9	47.3	31.8	34.8
Core curriculum	96.5	3.7	26.8	69.5	59.0	13.4	38.1	48.5	60.9	37.4	23.9	54.4	21.7	39.1
Middle-level curriculum	124.5	0.9	10.1	88.9	79.8	3.2	26.8	70.0	64.8	44.6	18.1	46.7	35.2	35.2
Rigorous curriculum	133.9	0.1	3.5	96.3	94.0	0.1	18.9	81.0	71.6	39.9	27.6	41.1	31.2	28.4
General education	86.1	6.7	32.9	60.5	53.8	18.8	38.8	42.4	59.6	32.3	32.0	48.4	19.6	40.4
Among those who initially enrolled in 4-year institution														
Total	121.8	1.0	11.9	87.1	79.9	2.7	28.0	69.3	67.0	42.0	22.7	44.6	32.6	33.0
Career and technical education (CTE), total	105.7	1.6	23.9	74.6	62.2	4.8	46.1	49.1	61.9	43.5	23.1	40.2	36.7	38.1
CTE only	100.1	2.5	26.0	71.6	59.3	8.6	48.5	42.9	61.8	40.9	24.7	42.9	32.4	38.2
Dual CTE and college preparatory	110.8	0.7	21.9	77.3	64.9	1.4	43.9	54.7	62.0	45.9	21.7	37.7	40.6	38.0
College preparatory only	128.3	0.5	7.8	91.7	85.4	1.8	23.2	74.9	67.7	42.9	20.5	46.7	32.8	32.3
Core curriculum	109.5	1.7	21.1	77.2	70.2	7.4	37.3	55.2	64.6	39.4	22.4	50.2	27.5	35.4
Middle-level curriculum	130.9	0.4	6.3	93.3	85.9	1.1	21.6	77.3	66.9	45.0	17.5	47.6	34.9	33.1
Rigorous curriculum	133.9	#	2.8	97.2	94.7	#	18.4	81.6	72.3	39.2	28.1	41.5	30.4	27.7
General education	115.1	1.8	15.5	82.8	75.8	3.6	30.2	66.2	67.9	39.3	27.2	42.3	30.5	32.1

See notes at end of table.

Table 6. Undergraduate total, academic, and career-related credits earned as of 2000 by 1992 12th-grade students who enrolled in postsecondary education between 1992 and 2000, by high school curriculum concentration and institution type—Continued

	Total undergraduate credits				Undergraduate academic credits					Undergraduate career-related credits				
		Percentage distribution				Percentage distribution					Percentage distribution			
High school curriculum concentration	Mean	0–10	11–59	60 or more	Mean	0–10	11–59	60 or more	Percent of total credits[1]	Mean	0–10	11–59	60 or more	Percent of total credits[1]
Among those who initially enrolled in community college														
Total	75.3	9.3	37.2	53.5	43.1	24.1	45.0	30.9	55.2	32.1	30.7	50.9	18.5	44.8
Career and technical education (CTE), total	61.6	15.1	41.0	43.9	30.4	36.6	45.0	18.4	47.0	31.2	31.6	50.1	18.3	53.0
CTE only	56.1	17.2	42.9	39.9	26.6	41.3	44.9	13.8	44.7	29.5	34.2	49.0	16.9	55.3
Dual CTE and college preparatory	81.4	7.5	34.1	58.4	44.1	19.8	45.3	35.0	55.2	37.3	22.4	54.0	23.6	44.8
College preparatory only	100.4	3.6	23.5	72.9	58.8	10.9	40.1	48.9	59.1	41.6	21.3	49.0	29.7	40.9
Core curriculum	81.9	5.8	32.0	62.2	46.1	18.0	40.7	41.3	57.4	35.8	25.8	58.4	15.8	42.6
Middle-level curriculum	109.5	2.4	19.0	78.6	65.2	7.3	40.3	52.4	60.0	44.3	18.9	44.4	36.6	40.0
Rigorous curriculum	129.4	3.0	17.6	79.4	76.6	3.0	31.5	65.5	59.3	52.8	17.8	34.2	48.0	40.7
General education	67.0	9.7	43.7	46.6	40.3	25.4	48.0	26.5	57.2	26.7	36.0	52.5	11.4	42.8

Rounds to zero.

[1] The ratios of academic to total credits, and of career-related to total credits, were computed for each student, and the average of those values was then estimated.

NOTE: This table includes 1992 12th-grade students who had enrolled in postsecondary education between 1992 and 2000 and had both complete high school and postsecondary transcripts. See table 1 for high school concentration definitions. Undergraduate academic credits are defined as those earned in the traditional liberal arts and sciences fields (i.e., mathematics, sciences, English/letters, humanities, social sciences, fine and performing arts, and liberal studies) while undergraduate career-related credits are defined as those earned in fields associated with occupations such as engineering, education, and health (Hudson and Shafer 2004). See appendix B for more information. Details may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/92), "Second Follow-up, High School Transcript Survey, 1992" and National Education Longitudinal Study of 1988 (NELS:88/2000), "Fourth Follow-up, Postsecondary Education Transcript Survey, 2000."

Table 7. Percentage of students who earned any undergraduate credits in specific career-related fields among 1992 12th-graders who enrolled in postsecondary education between 1992 and 2000, by high school curriculum concentration and institution type

High school concentration	Agriculture and natural resources	Business	Marketing	Technology and communications: Communications and related technology	Technology and communications: Computer science	Technology and communications: Engineering and related technology	Education and child care	Health care	Public and protective services	Personal and other services	Trade and industry	Food service and hospitality
Total	15.0	58.9	19.4	23.6	18.7	12.2	28.0	29.4	20.7	2.2	26.0	2.0
Career and technical education (CTE), total	11.3	63.4	17.0	17.6	18.7	16.6	17.6	22.9	17.7	1.9	29.8	1.5
CTE only	8.9	63.1	14.3	15.2	16.3	15.7	14.2	21.6	15.8	2.4	29.9	1.0
Dual CTE and college preparatory	16.1	63.9	22.5	22.5	23.4	18.4	24.5	25.4	21.4	1.0	29.5	2.5
College preparatory only	18.9	58.5	21.9	24.4	21.9	13.5	32.7	31.8	21.4	1.7	25.5	2.1
Core curriculum	21.8	61.4	22.8	24.7	18.3	11.3	31.6	27.1	18.4	1.0	22.1	1.8
Middle-level curriculum	18.3	61.1	22.7	24.2	20.8	13.3	33.9	33.7	22.6	2.2	25.4	2.4
Rigorous curriculum	17.4	45.3	17.7	24.8	30.2	17.4	29.3	30.4	20.4	0.5	30.2	1.3
General education	11.9	57.1	17.6	25.5	14.8	8.4	27.2	29.6	21.4	2.9	24.8	2.2
Among those who initially enrolled in 4-year institution												
Total	17.1	55.5	21.0	27.3	22.5	14.3	34.6	29.8	22.1	2.1	27.8	2.1
Career and technical education (CTE), total	16.8	63.0	22.3	22.0	23.2	17.9	25.6	21.2	20.4	2.4	28.9	1.8
CTE only	16.0	62.7	20.4	20.7	23.1	17.9	25.0	21.1	20.5	4.1	24.1	1.1
Dual CTE and college preparatory	17.5	63.3	24.1	23.2	23.2	18.0	26.0	21.2	20.4	0.8	33.4	2.3
College preparatory only	18.3	55.1	20.8	27.1	24.4	14.9	35.8	31.4	23.1	2.0	27.1	2.1
Core curriculum	19.9	61.4	17.2	31.8	23.4	14.2	38.7	25.9	22.5	1.7	28.8	1.4
Middle-level curriculum	18.1	57.5	23.0	26.9	23.1	14.2	37.0	33.2	24.2	2.6	25.7	2.5
Rigorous curriculum	17.7	43.5	16.7	24.6	28.9	17.3	30.0	29.6	20.1	0.2	29.9	1.4
General education	14.9	53.2	20.9	30.0	18.5	11.5	35.9	30.1	20.9	2.2	28.8	2.3

See notes at end of table.

Table 7. Percentage of students who earned any undergraduate credits in specific career-related fields among 1992 12th-graders who enrolled in postsecondary education between 1992 and 2000, by high school curriculum concentration and institution type—Continued

High school curriculum concentration	Agriculture and natural resources	Business	Marketing	Technology and communications: Communications and related technology	Technology and communications: Computer science	Technology and communications: Engineering and related technology	Education and child care	Health care	Public and protective services	Personal and other services	Trade and industry	Food service and hospitality
Among those who initially enrolled in community college												
Total	13.7	64.2	17.4	19.6	14.7	9.7	20.4	29.5	20.2	1.2	23.3	1.9
Career and technical education (CTE), total	8.9	64.5	11.3	15.3	17.7	16.3	14.5	24.4	17.0	0.4	29.4	0.9
CTE only	7.1	64.2	9.7	13.7	15.0	14.9	11.3	22.9	15.3	0.3	31.5	1.1
Dual CTE and college preparatory	15.7	65.6	16.8	20.7	27.6	21.6	25.7	29.9	23.3	0.7	21.6	0.4
College preparatory only	22.4	68.1	26.5	18.3	15.0	9.7	23.9	34.2	16.9	0.8	21.8	1.9
Core curriculum	25.8	61.9	31.2	17.6	12.6	6.8	21.8	29.1	14.2	#	13.0	2.5
Middle-level curriculum	21.0	71.2	23.4	17.8	14.3	10.8	25.8	36.6	18.4	0.9	25.8	1.6
Rigorous curriculum	10.2	76.5	33.6	34.2	54.7	20.9	10.4	44.4	16.5	6.2	39.7	0.9
General education	10.9	61.5	15.0	22.9	12.7	5.9	21.5	29.3	24.1	2.0	20.9	2.4

Rounds to zero.

NOTE: This table includes 1992 12th-grade students who had enrolled in postsecondary education between 1992 and 2000 and had both complete high school and postsecondary transcripts. See table 1 for high school concentration definitions. Undergraduate career-related credits are defined as those earned in fields associated with occupations, in contrast to academic credits, which are defined as those earned in the traditional liberal arts and sciences fields (i.e., mathematics, sciences, English/letters, humanities, social sciences, fine and performing arts, and liberal studies) (Hudson and Shafer 2004). See appendix B for more information.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/92), "Second Follow-up, High School Transcript Survey, 1992" and National Education Longitudinal Study of 1988 (NELS:88/2000), "Fourth Follow-up, Postsecondary Education Transcript Survey, 2000."

Table 8. Average number of undergraduate credits earned in specific career-related fields among 1992 12th-graders who enrolled in postsecondary education between 1992 and 2000 and who took a course in the field, by high school curriculum concentration and institution type

High school concentration	Agriculture and natural resources	Business	Marketing	Technology and communications: Communications and related technology	Technology and communications: Computer science	Technology and communications: Engineering and related technology	Education and child care	Health care	Public and protective services	Personal and other services	Trade and industry	Food service and hospitality
Total	10.1	16.4	5.7	9.0	8.5	18.2	17.9	17.4	11.6	15.8	17.1	12.4
Career and technical education (CTE), total	13.8	17.8	5.9	6.7	8.3	20.6	19.9	14.2	12.1	‡	18.7	‡
CTE only	15.2	17.2	5.6	6.2	7.9	20.2	15.0	14.8	11.0	‡	19.1	‡
Dual CTE and college preparatory	12.2	19.0	6.2	7.4	8.9	21.1	25.6	13.2	13.8	‡	17.9	‡
College preparatory only	10.8	17.5	6.0	9.2	8.3	18.3	18.0	21.3	11.6	11.7	18.4	13.1
Core curriculum	8.0	16.7	4.9	7.3	8.3	22.1	20.7	14.2	13.8	‡	14.9	‡
Middle-level curriculum	12.9	17.6	6.5	9.5	8.4	15.7	18.1	23.2	11.7	10.3	18.3	14.8
Rigorous curriculum	6.8	18.6	5.2	10.3	8.0	22.9	13.9	20.8	8.7	‡	22.0	‡
General education	7.1	14.3	5.2	9.5	9.2	15.4	17.2	13.6	11.5	18.8	14.3	13.1
Among those who initially enrolled in 4-year institution												
Total	9.4	18.4	6.0	10.0	9.1	17.0	19.1	17.7	11.4	11.3	17.2	10.7
Career and technical education (CTE), total	14.1	20.3	6.0	8.1	10.3	19.9	22.3	20.3	12.2	‡	15.8	‡
CTE only	15.1	19.7	4.7	8.6	10.4	22.0	14.6	25.4	9.2	‡	15.8	‡
Dual CTE and college preparatory	13.3	20.9	7.0	7.7	10.2	18.1	29.0	15.7	15.0	‡	15.8	‡
College preparatory only	8.7	18.1	6.2	9.8	8.1	17.3	18.5	18.7	11.3	9.0	19.6	11.1
Core curriculum	9.7	12.3	5.9	8.2	9.1	21.4	20.1	13.0	15.0	‡	13.9	‡
Middle-level curriculum	9.1	19.6	6.6	10.0	8.2	14.6	19.3	18.8	11.0	8.8	19.8	12.1
Rigorous curriculum	6.8	18.2	5.1	10.3	7.4	21.7	14.2	21.7	9.1	‡	22.9	‡
General education	8.8	18.1	5.5	10.9	11.1	14.0	19.4	14.8	11.3	16.9	13.1	‡

See notes at end of table.

Table 8. Average number of undergraduate credits earned in specific career-related fields among 1992 12th-graders who enrolled in postsecondary education between 1992 and 2000 and who took a course in the field, by high school curriculum concentration and institution type—Continued

High school concentration	Agriculture and natural resources	Business	Marketing	Technology and communications: Communications and related technology	Technology and communications: Computer science	Technology and communications: Engineering and related technology	Education and child care	Health care	Public and protective services	Personal and other services	Trade and industry	Food service and hospitality
Among those who initially enrolled in community college												
Total	11.7	13.9	5.1	7.5	7.0	20.7	14.7	16.9	11.6	18.1	16.2	12.3
Career and technical education (CTE), total	13.6	15.4	4.6	5.4	6.6	21.4	17.3	10.2	11.9	‡	18.5	‡
CTE only	15.6	15.5	5.0	4.6	6.4	20.0	15.5	10.5	11.5	‡	18.8	‡
Dual CTE and college preparatory	‡	15.1	‡	‡	7.0	24.9	‡	9.3	12.9	‡	17.0	‡
College preparatory only	16.3	16.8	5.6	7.0	7.7	22.6	15.0	27.7	11.9	‡	14.1	‡
Core curriculum	6.5	23.6	4.2	5.2	6.7	‡	21.5	15.1	11.2	‡	17.5	‡
Middle-level curriculum	23.3	13.1	6.5	7.6	6.8	21.1	12.1	34.8	12.6	‡	13.6	‡
Rigorous curriculum	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡
General education	4.9	11.0	4.7	8.5	6.7	17.6	13.5	12.0	11.4	15.2	15.8	‡

‡ Reporting standards not met. (Too few cases for a reliable estimate.)

NOTE: This table includes 1992 12th-grade students who had enrolled in postsecondary education between 1992 and 2000 and had both complete high school and postsecondary transcripts. See table 1 for high school concentration definitions. Undergraduate career-related credits are defined as those earned in fields associated with occupations, in contrast to academic credits, which are defined as those earned in the traditional liberal arts and sciences fields (i.e., mathematics, sciences, English/letters, humanities, social sciences, fine and performing arts, and liberal studies) (Hudson and Shafer 2004). See appendix B for more information.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/92), "Second Follow-up, High School Transcript Survey, 1992" and National Education Longitudinal Study of 1988 (NELS:88/2000), "Fourth Follow-up, Postsecondary Education Transcript Survey, 2000."

Table 9. Percentage distribution of postsecondary attainment and enrollment status in 2000 among 1992 12th-grade students who enrolled in postsecondary education between 1992 and 2000, by high school curriculum concentration

High school concentration	Earned any postsecondary credential	Highest postsecondary credential as of 2000			No degree						
						Credits earned				Enrollment in 2000	
		Certificate	Associate's	Bachelor's or higher	Total	0–10	11–29	30–59	60 or more	Enrolled	Not enrolled
Total	61.2	5.4	9.0	46.8	38.8	7.4	12.0	8.4	10.9	7.4	31.4
Career and technical education (CTE), total	50.3	8.0	16.3	25.9	49.7	14.0	15.2	12.3	8.2	6.4	43.3
CTE only	43.9	9.9	17.6	16.4	56.1	16.7	18.2	12.1	9.2	6.9	49.2
Dual CTE and college preparatory	63.1	4.1	13.8	45.2	36.9	8.6	9.3	12.9	6.2	5.4	31.6
College preparatory only	74.5	3.5	6.6	64.5	25.5	2.7	5.4	6.6	10.8	5.1	20.4
Core curriculum	60.5	4.7	10.3	45.5	39.5	6.1	11.7	9.9	11.7	5.5	34.0
Middle-level curriculum	75.7	3.9	6.6	65.1	24.3	2.1	4.4	6.3	11.6	5.3	19.1
Rigorous curriculum	87.5	0.2	2.0	85.3	12.5	1.0	1.5	3.6	6.5	3.9	8.6
General education	49.9	6.5	8.2	35.2	50.1	10.1	18.9	8.8	12.4	10.7	39.4

NOTE: This table includes 1992 12th-grade students who had enrolled in postsecondary education between 1992 and 2000 and had both complete high school and postsecondary transcripts. See table 1 for high school concentration definitions. Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/92), "Second Follow-up, High School Transcript Survey, 1992" and National Education Longitudinal Study of 1988 (NELS:88/2000), "Fourth Follow-up, Postsecondary Education Transcript Survey, 2000."

Table 10. Percentage distribution of certificate majors among 1992 12th-grade students who had earned a certificate by 2000, by high school curriculum concentration

		Career-related fields												
							Technology and communications							
High school concentration	Total[1]	Agriculture and natural resources	Business	Marketing	Health care	Public and protective services	Communications and related technologies	Computer science	Engineering	Trade and industry	Food service and hospitality	Education and child care	Personal and other services	Other field
Total	99.0	1.0	24.8	0.7	28.3	3.3	0.5	1.0	1.7	23.7	4.7	3.3	5.8	0.4
Career and technical education (CTE), total	100.0	2.2	19.8	#	20.1	2.9	1.2	#	0.8	42.0	5.9	2.6	2.6	#
CTE only	100.0	1.9	19.2	#	20.2	2.2	1.5	#	0.9	40.8	7.1	3.1	3.1	#
Dual CTE and college preparatory	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡
College preparatory only	99.1	#	14.8	#	54.8	4.9	0.3	1.0	4.6	12.7	2.7	1.4	1.9	#
Core curriculum	100.0	#	15.4	#	49.0	3.6	#	1.2	3.8	24.9	#	2.3	#	#
Middle-level curriculum	100.0	#	14.9	#	58.2	5.5	0.4	1.0	5.0	8.5	3.8	#	2.6	#
Rigorous curriculum	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡
General education	98.3	1.0	34.8	1.6	14.4	2.4	0.3	1.7	0.5	20.8	5.3	5.2	10.4	0.9

Rounds to zero.

‡ Reporting standards not met. (Too few cases for a reliable estimate.)

[1] This total column reports the percentage of students who earned a certificate in a career-related field. Very few students earned certificates in academic fields and therefore information about specific academic fields is not presented.

NOTE: This table includes 1992 12th-grade students who had enrolled in postsecondary education between 1992 and 2000, had both complete high school and postsecondary transcripts, and had earned a certificate by 2000. See table 1 for high school concentration definitions. Certificate career-related majors are defined as those earned in fields associated with occupations, in contrast to academic certificate majors, defined as those earned in the traditional liberal arts and sciences fields (i.e., mathematics, sciences, English/letters, humanities, social sciences, fine and performing arts, and liberal studies) (Hudson and Shafer 2004). See appendix B for more information. Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/92), "Second Follow-up, High School Transcript Survey, 1992" and National Education Longitudinal Study of 1988 (NELS:88/2000), "Fourth Follow-up, Postsecondary Education Transcript Survey, 2000."

Table 11-A. Percentage distribution of associate's degree majors among 1992 12th-grade students who had earned an associate's degree by 2000, by high school curriculum concentration: Academic fields

	Academic fields							
High school concentration	Total	Mathe-matics	Science	English	Humanities	Social sciences	Fine and performing arts	Liberal studies
Total	41.1	#	2.9	#	0.3	2.5	1.0	34.5
Career and technical education (CTE), total	35.6	#	1.0	#	0.3	0.6	0.7	33.1
CTE only	29.8	#	0.9	#	#	0.5	0.6	27.9
Dual CTE and college preparatory	47.6	#	1.2	#	0.8	0.9	1.0	43.7
College preparatory only	40.2	#	3.4	#	0.5	3.7	0.5	32.1
Core curriculum	46.9	#	5.9	#	#	8.1	0.8	32.0
Middle-level curriculum	38.2	#	2.1	#	0.9	2.1	0.4	32.7
Rigorous curriculum	‡	‡	‡	‡	‡	‡	‡	‡
General education	47.4	#	4.0	#	#	2.9	1.8	38.6

Rounds to zero.

‡ Reporting standards not met. (Too few cases for a reliable estimate.)

NOTE: This table includes 1992 12th-grade students who had enrolled in postsecondary education between 1992 and 2000, had both complete high school and postsecondary transcripts, and had earned an associate's degree by 2000. See table 1 for high school concentration definitions. Associate's degree academic majors are defined as those earned in the traditional liberal arts and sciences fields (i.e., mathematics, sciences, English/letters, humanities, social sciences, fine and performing arts, and liberal studies) (Hudson and Shafer 2004). See appendix B for more information. Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/92), "Second Follow-up, High School Transcript Survey, 1992" and National Education Longitudinal Study of 1988 (NELS:88/2000), "Fourth Follow-up, Postsecondary Education Transcript Survey, 2000."

Table 11-B. Percentage distribution of associate's degree majors among 1992 12th-grade students who had earned an associate's degree by 2000, by high school curriculum concentration: Career-related fields

	Career-related fields													
							Technology and communications							
High school concentration	Total	Agriculture and natural resources	Business	Marketing	Health care	Public and protective services	Communications and related technologies	Computer science	Engineering	Trade and industry	Food service and hospitality	Education and child care	Personal and other services	Other field
Total	58.8	0.7	14.6	1.3	13.5	7.2	0.6	2.5	7.8	6.4	1.7	2.0	0.4	0.1
Career and technical education (CTE), total	64.4	1.2	25.4	1.1	9.0	5.6	0.1	1.9	10.5	5.5	1.3	2.3	0.4	#
CTE only	70.2	1.8	28.4	1.5	8.3	6.2	0.2	2.0	10.6	6.8	1.2	3.2	#	#
Dual CTE and college preparatory	52.4	#	19.2	0.4	10.5	4.4	#	1.7	10.3	2.7	1.5	0.6	1.1	#
College preparatory only	59.5	0.8	7.9	2.0	21.0	7.0	1.1	2.5	9.6	3.0	2.0	2.2	0.3	0.2
Core curriculum	53.1	1.0	6.7	0.7	9.6	7.1	1.1	0.1	17.5	4.7	1.7	2.1	0.8	#
Middle-level curriculum	61.5	0.4	9.2	2.8	28.2	5.1	0.9	3.5	4.9	2.2	2.4	2.0	#	0.4
Rigorous curriculum	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡	‡
General education	52.5	0.3	12.2	0.7	8.8	8.9	0.5	3.1	3.2	11.2	1.6	1.3	0.6	0.2

Rounds to zero.

‡ Reporting standards not met. (Too few cases for a reliable estimate.)

NOTE: This table includes 1992 12th-grade students who had enrolled in postsecondary education between 1992 and 2000, had both complete high school and postsecondary transcripts, and had earned a certificate by 2000. See table 1 for high school concentration definitions. Associate's degree career-related majors are defined as those earned in fields with occupations, in contrast to academic majors earned in the traditional liberal arts and sciences fields (i.e., mathematics, sciences, English/letters, humanities, social sciences, fine and performing arts, and liberal studies) (Hudson and Shafer 2004). See appendix B for more information. Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/92), "Second Follow-up, High School Transcript Survey, 1992" and National Education Longitudinal Study of 1988 (NELS:88/2000), "Fourth Follow-up, Postsecondary Education Transcript Survey, 2000."

Table 12-A. Percentage distribution of bachelor's degree majors among 1992 12th-grade students who had earned a bachelor's degree by 2000, by high school curriculum concentration: Academic fields

	Academic fields							
High school concentration	Total	Mathematics	Science	English	Humanities	Social sciences	Fine and performing arts	Liberal studies
Total	41.4	1.5	8.0	4.6	2.7	18.5	5.6	0.4
Career and technical education (CTE), total	26.8	1.2	5.0	3.8	1.9	14.4	0.4	#
CTE only	25.7	0.4	5.5	2.0	#	16.8	0.9	#
Dual CTE and college preparatory	27.7	1.8	4.7	5.2	3.3	12.7	#	#
College preparatory only	43.4	1.8	9.4	4.9	2.6	20.4	4.0	0.3
Core curriculum	32.1	0.9	5.0	2.6	1.6	17.6	3.9	0.6
Middle-level curriculum	42.2	2.0	8.5	4.3	1.9	21.0	4.3	0.3
Rigorous curriculum	54.2	2.1	15.0	8.0	5.5	20.3	3.2	#
General education	42.1	0.9	5.9	4.2	3.0	15.9	11.4	0.9

Rounds to zero.

NOTE: This table includes 1992 12th-grade students who had enrolled in postsecondary education between 1992 and 2000, had both complete high school and postsecondary transcripts, and had earned an associate's degree by 2000. See table 1 for high school concentration definitions. Bachelor's degree academic majors are defined as those earned in the traditional liberal arts and sciences fields (i.e., mathematics, sciences, English/letters, humanities, social sciences, fine and performing arts, and liberal studies) (Hudson and Shafer 2004). See appendix B for more information. Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/92), "Second Follow-up, High School Transcript Survey, 1992" and National Education Longitudinal Study of 1988 (NELS:88/2000), "Fourth Follow-up, Postsecondary Education Transcript Survey, 2000."

Table 12-B. Percentage distribution of bachelor's degree majors among 1992 12th-grade students who had earned a bachelor's degree by 2000, by high school curriculum concentration: Career-related fields

	Career-related fields													
							Technology and communications							
High school concentration	Total	Agriculture and natural resources	Business	Marketing	Health care	Public and protective services	Communications and related technologies	Computer science	Engineering	Trade and industry	Food service and hospitality	Education and child care	Personal and other services	Other field
Total	55.6	2.3	15.3	2.8	6.8	3.9	5.9	1.6	4.1	3.6	0.4	8.0	1.0	3.0
Career and technical education (CTE), total	69.7	4.4	20.2	4.1	4.2	6.0	4.8	2.8	6.6	4.8	0.7	10.9	0.2	3.5
CTE only	72.0	4.1	28.4	4.3	7.6	2.3	4.6	2.1	6.8	3.8	0.6	7.4	0.1	2.3
Dual CTE and college preparatory	68.0	4.6	14.2	4.0	1.7	8.7	5.0	3.3	6.4	5.5	0.8	13.4	0.3	4.3
College preparatory only	53.6	2.4	15.4	2.6	6.3	3.5	5.2	1.1	4.4	3.9	0.4	7.7	0.9	3.0
Core curriculum	60.6	3.6	22.7	1.8	3.7	5.2	3.4	0.9	3.3	2.9	0.6	10.9	1.7	7.2
Middle-level curriculum	54.9	2.4	14.5	3.2	7.4	3.8	5.4	1.3	3.5	3.7	0.4	8.7	0.8	2.9
Rigorous curriculum	45.4	1.5	13.2	1.3	4.6	1.3	6.0	1.0	7.6	5.1	0.2	2.7	0.8	0.4
General education	55.0	1.2	13.4	2.7	9.1	4.0	7.8	2.4	2.6	2.6	0.2	7.5	1.4	2.9

NOTE: This table includes 1992 12th-grade students who had enrolled in postsecondary education between 1992 and 2000, had both complete high school and postsecondary transcripts, and had earned a certificate by 2000. See table 1 for high school concentration definitions. Bachelor's degree career-related majors are defined as those earned in fields with occupations, in contrast to academic majors earned in the traditional liberal arts and sciences fields (i.e., mathematics, sciences, English/letters, humanities, social sciences, fine and performing arts, and liberal studies) (Hudson and Shafer 2004). See appendix B for more information. Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/92), "Second Follow-up, High School Transcript Survey, 1992" and National Education Longitudinal Study of 1988 (NELS:88/2000), "Fourth Follow-up, Postsecondary Education Transcript Survey, 2000."

Table 13. Percentage of 1992 12th-grade students who were career and technical education (CTE) concentrators and earned various amounts of undergraduate credits in a related career field among those who enrolled in postsecondary education between 1992 and 2000, by high school CTE field

High school CTE field	Any credit	3 or more credits	6 or more credits	9 or more credits	12 or more credits
Total	51.8	49.2	36.5	31.5	27.3
Agriculture and natural resources	30.9	29.4	25.2	23.8	23.3
Business	75.7	72.1	56.5	48.2	41.8
Marketing	25.0	25.0	10.2	6.3	4.2
Health care	‡	‡	‡	‡	‡
Public and protective services	‡	‡	‡	‡	‡
Trade and industry	47.0	44.4	31.0	26.7	22.7
Technology and communications	26.3	25.5	12.2	9.7	8.6
Personal and other services	3.0	3.0	3.0	3.0	3.0
Food service and hospitality	‡	‡	‡	‡	‡
Child care and education	‡	‡	‡	‡	‡

‡ Reporting standards not met. (Too few cases for a reliable estimate.)

NOTE: This table includes 1992 12th-grade students who were career and technical education concentrators, had enrolled in postsecondary education between 1992 and 2000, and had both complete high school and postsecondary transcripts. See table 1 for a definition of CTE concentrators.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/92), "Second Follow-up, High School Transcript Survey, 1992" and National Education Longitudinal Study of 1988 (NELS:88/2000), "Fourth Follow-up, Postsecondary Education Transcript Survey, 2000."

Table 14. Percentage of 1992 12th-grade students who were career and technical education (CTE) concentrators and earned a postsecondary degree or certificate among students who enrolled in postsecondary education between 1992 and 2000 and percentage whose degree or certificate was in a related career field between 1992 and 2000, by high school CTE field

	Earned a degree or certificate		Earned a certificate		Earned an associate's degree		Earned a bachelor's degree	
High school CTE field	Total	In a related field among those who earned a degree or certificate	Total	In a related field among those who earned a certificate	Total	In a related field among those who earned an associate's degree	Total	In a related field among those who earned a bachelor's degree
Total	50.3	31.9	8.5	49.3	22.3	29.4	25.9	22.7
Agriculture and natural resources	57.0	24.8	10.7	‡	22.9	‡	34.0	‡
Business	60.0	37.4	7.7	39.1	28.2	43.1	35.1	23.5
Marketing	44.7	‡	6.9	‡	13.5	‡	25.2	‡
Health care	‡	‡	‡	‡	‡	‡	‡	‡
Public and protective services	‡	‡	‡	‡	‡	‡	‡	‡
Trade and industry	41.2	29.7	10.8	71.2	19.1	13.5	14.5	15.3
Technology and communications	65.0	34.8	2.5	‡	14.2	‡	53.9	30.1
Personal and other services	28.0	‡	5.7	‡	22.8	‡	0.7	‡
Food service and hospitality	‡	‡	‡	‡	‡	‡	‡	‡
Child care and education	‡	‡	‡	‡	‡	‡	‡	‡

‡ Reporting standards not met. (Too few cases for a reliable estimate.)

NOTE: This table includes 1992 12th-grade students who were career and technical education concentrators, had enrolled in postsecondary education between 1992 and 2000, and had both complete high school and postsecondary transcripts. See table 1 for CTE concentrator definition. Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/92), "Second Follow-up, High School Transcript Survey, 1992" and National Education Longitudinal Study of 1988 (NELS:88/2000), "Fourth Follow-up, Postsecondary Education Transcript Survey, 2000."

Table 15. Percentage distribution of postsecondary attainment and enrollment status among 1992 12th-grade students who were career and technical education (CTE) concentrators and had enrolled in postsecondary education between 1992 and 2000, by number of undergraduate credits earned in a related career field

Undergraduate credits earned in a related career field	Highest degree earned as of 2000				No degree						
						Credits earned				Enrollment in 2000	
	Total	Certificate	Associate's	Bachelor's or higher	Total	0–10	11–29	30–59	60 or more	Enrolled	Not enrolled
Total	50.3	8.0	16.3	25.9	49.7	14.0	15.2	12.3	8.2	6.4	43.3
None	40.0	6.3	12.3	21.4	60.0	17.9	19.9	13.2	8.9	7.0	53.0
Any credits	59.8	9.5	20.1	30.2	40.2	10.4	10.8	11.5	7.5	5.8	34.4
1–3	47.8	4.1	13.8	29.9	52.2	17.9	8.1	13.1	13.1	6.7	45.5
4–6	53.4	3.8	12.4	37.3	46.6	26.8	10.0	6.5	3.3	3.4	43.2
7–9	45.1	4.4	10.2	30.5	54.9	9.1	26.8	6.4	12.7	6.8	48.1
10–12	23.5	11.2	8.5	3.8	76.5	28.0	27.2	13.8	7.5	8.0	68.5
13 or more	74.1	14.2	28.4	31.6	25.9	0.2	7.4	12.9	5.4	5.7	20.2

NOTE: This table includes 1992 12th-grade students who were career and technical education concentrators, had enrolled in postsecondary education between 1992 and 2000, and had both complete high school and postsecondary transcripts. See table 1 for CTE concentrator definition. Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/92), "Second Follow-up, High School Transcript Survey, 1992" and National Education Longitudinal Study of 1988 (NELS:88/2000), "Fourth Follow-up, Postsecondary Education Transcript Survey, 2000."

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Appendix A—Glossary

This glossary describes the variables used in this publication. In the index below, the variables are organized by general topic and, within topic, listed in the order in which they appear in the tables. The glossary is in alphabetical order by the variable names (displayed in capital letters to the right of the variable label) from the National Education Longitudinal Study of 1988 (NELS:88/2000) database.

GLOSSARY INDEX

Variable

Associate's degree major based on high school curriculum concentration areas **AAMAJOR**

This variable was derived by recoding the major field for the first associate's degree earned by the student (MAJCOD3) so that the major field groupings (in particular, nonacademic field groupings) are aligned to high school career and technical education (CTE) concentration fields. The detailed major fields in MAJCOD3 were aggregated into the following categories:

Aggregated major field	**Detailed major field in MAJCOD3**
Mathematics	Mathematics/statistics
Science	Chemistry, integrated/general science, biological science
Humanities	Interdisciplinary humanities, Bible studies
Social sciences	General social science, psychology, history, sociology
Fine and performing arts	Drama, speech, music, fine arts/fine history, other fine and performance arts
Liberal studies	Liberal and general studies
Agriculture and natural resources	Agriculture business and production, agriculture/animal/plant science, conservation/natural resources, forestry
Business	Accounting, finance, business administration/management, other business, secretarial/clerical, other business support, medical office support, data/information management
Marketing	Marketing and distribution, retailing
Health care	Medical/veterinary laboratory technology/assistance, dental assistance/hygiene, nursing, other allied health, physical therapy, occupational therapy, respiratory therapy/technology, radiological technology, clinical health sciences, nursing, nutrition/food science
Public and protective services	Paralegal/pre-law, law, administration of justice, fire science, social work, human/community service
Technology and communications: Computer science	Computer programming, computer science, information technologies
Technology and communications: Communications and related technology	Communications, communications technologies, journalism
Technology and communications: Engineering	Computer technology, computer technology engineering technology: non-electrical
Trade and industry	Graphic/print communications, interior design, construction, mechanics and repairs, precision production, air transportation, graphic and industrial design
Food service and hospitality	Culinary arts/food management, hospitality management

Education and child care	Early childhood education, elementary education, other education, child study/guidance
Personal and other services	Textiles/fashion, family and consumer sciences, and other human ecology, other personal service
Other	Physical education, health, recreation, other

Number of undergraduate credits earned in academic fields **ACACRED**

This variable was derived by summing the number of undergraduate credits earned in mathematics, sciences, English/letters, humanities, social sciences, fine and performing arts, and liberal studies. The number of credits earned in each academic field was the sum of credits earned in various course aggregates within the field. For example, total number of credits earned in mathematics was the sum of credits earned in four aggregated course categories: college-level mathematics, calculus and advanced mathematics, statistics, and other mathematics. For more information about aggregated course categories, see *The Empirical Curriculum: Changes in Postsecondary Course-Taking, 1972–2000* (Adelman 2004a).

Academic field	**Aggregated course categories**
Mathematics	College-level mathematics, calculus and advanced mathematics, statistics, other mathematics
Sciences	General biology, generalized sciences, biology service courses, biological sciences, chemistry, geology and earth science, physics, other physical sciences
English/letters	Composition and writing, literature/letters
Humanities	Spanish language, other foreign languages, classical studies, linguistics and language study, ethics, Bible study, theology, philosophy and religious studies
Social sciences	U.S. history, area studies, ethnic/culture studies, women's/gender studies, general psychology, other psychology, interdisciplinary social science, anthropology, archaeology, introductory economics, other economics, geography, western civilization/world history, other history, international relations, U.S./state government, other political science, introduction to sociology, other sociology
Fine and performing arts	Art history, fine arts, theater and dance, film arts, music performance, music
Liberal studies	Liberal arts, science, technology, and society

Number of undergraduate credits earned in agriculture and natural resources **AGRCRED**

This variable was derived by summing the number of credits earned in the following aggregated course categories: agricultural business and economics, agricultural production, agricultural sciences, environment and natural resources, and forestry.

Variable

Bachelor's degree major based on high school curriculum concentration areas **BAMAJOR**

This variable was derived by recoding the major field for the first bachelor's degree earned by the student (MAJCOD4) so that the major field groupings (in particular, nonacademic field groupings) are aligned to high school CTE concentration fields. The detailed major fields in MAJCOD4 were aggregated into the following categories:

Aggregated major field	**Detailed major field in MAJCOD4**
Mathematics	Mathematics/statistics
Science	Biochemistry, other biological science, chemistry, geology/earth science, physics, other physical sciences
English	English/American literature, creative and technology writing, other letters
Humanities	Foreign languages, interdisciplinary humanities, philosophy, religious studies, theology, Bible studies
Social sciences	American studies/civilization, area studies, ethnic studies, women studies, biopsychology, integrated/general science, general social science, psychology, clinic/counsel psychology, anthropology/archaeology, economics, geography, history, sociology, political science, international relations
Fine and performing arts	Drama, speech, film arts, music, fine arts/fine history, other fine and performance arts
Liberal studies	Liberal and general studies
Agriculture and natural resources	Agriculture business and production, agriculture/animal/plant science, conservation/natural resources, forestry
Business	Accounting, finance, business administration/management, operations research/administration science, human resources management/labor relations, other business, other business support, medical office support, data/information management
Marketing	Marketing and distribution, retailing, real estate
Health care	Medical/veterinary laboratory technology/assistance, dental assistance/hygiene, nursing, other allied health, physical therapy, occupational therapy, other therapies, speech pathology/audiology, clinical health sciences, nursing, health/hospital administration, public health, other health science and profession, nutrition/food science
Public and protective services	Paralegal/pre-law, law, administration of justice, social work, public administration, human/community service, library/archival science
Technology and communications: Computer science	Computer programming, computer science, information technologies

Technology and communications: Communications and related technology	Communications, communications technologies, journalism, Radio/TV/film
Technology and communications: Engineering	Chemical engineering, civil engineering, computer engineering, computer technology, electronic/communications engineering, engineering technologies: electrical, engineering technology: non-electrical
Trade and industry	Mechanical engineering, other engineering, graphic/print communications, architecture/engineering design, interior design, air transportation, graphic and industrial design
Food service and hospitality	Culinary arts/food management, hospitality management
Education and child care	Early childhood education, elementary education, secondary education, special education, other education, child study/guidance
Personal and other services	Textiles/fashion, family and consumer sciences, and other human ecology, other personal service
Other	Physical education, recreation/sports, health, other

Number of undergraduate credits earned in business **BUSCRED**

This variable was derived by summing the number of credits earned in the following aggregated course categories: accounting, finance, insurance, real estate, business information technology, other business and management, financial services support, data and computer applications, and office occupations.

8th-grade reading/mathematics composite score **BY2XQURT**

This variable is based on students' performance on a reading and mathematics standardized test. Composite scores were standardized and broken into quartiles.

Grades from 6th to 8th grade **BYGRD68**

This variable is an average of self-reported grades in four subject areas (English, mathematics, science, and social studies) during grades 6 through 8.

Socioeconomic status **BYSES**

This variable was constructed using the following 8th-grade parent questionnaire data: father's education level, mother's education level, father's occupation, mother's occupation, and family income. Values were transformed into quartiles. Low is defined as the bottom quartile, middle is defined as the middle two quartiles, and high is defined as the top quartile.

Certificate based on high school curriculum concentration areas **CERMAJOR**

This variable was derived by recoding the major field for the first certificate earned by the student (MAJCOD2) so that the major field groupings (in particular, nonacademic field groupings) are aligned to high school CTE concentration fields. The detailed major fields in MAJCOD2 were aggregated into the following categories:

Aggregated major field	**Detailed major field in MAJCOD2**
Humanities	Foreign languages, theology
Liberal studies	Liberal/general studies
Agriculture and natural resources	Agriculture business and production
Business	Accounting, business administration/management, secretarial/clerical, other business support, medical office support, data/information management
Marketing	Marketing and distribution, retailing, real estate
Health care	Medical/veterinary laboratory technology/assistance, dental assistance/hygiene, practical nursing, other allied health, respiratory therapy/technology, radiologic technology, nursing
Public and protective services	Paralegal/pre-law, administration of justice, fire science, public administration
Technology and communications: Computer science	Computer programming, information technologies
Technology and communications: Communications and related technology	Communication technologies
Technology and communications: Engineering	Computer technology, computer technology engineering technology: non-electrical
Trade and industry	Construction, mechanical engineering, graphic/print communications, air transportation, other transportation, precision production, graphic and industrial design
Food service and hospitality	Culinary arts/food management, hospitality management
Education and child care	Early childhood education, child study/guidance
Personal and other services	Cosmetology, other personal service
Other	Health, physical education, recreation, other

Number of undergraduate credits earned in communications and related technology **COMMCRED**

This variable was derived by summing the number of credits earned in the following aggregated course categories: journalism, oral communication, mass communication, communication technologies, and communications: other.

Number of undergraduate credits earned in computer technology **COMPCRED**

This variable was derived by summing the number of credits earned in the following aggregated course categories: computer programming and computer science.

Attainment through 2000 **CREDRET**

A transcript-based variable indicating a credit-retention account of the highest level of postsecondary attainment through 2000. This variable has the following categories: bachelor's degree or higher, associate's degree, certificate, no degree but earned 60 or more credits, no degree but earned 30–50 credits, no degree but earned 11–29 credits, and no degree but earned 0–10 credits.

Time between high school graduation and postsecondary entry **DELAYTRI**

A transcript-based variable indicating time between high school graduation and postsecondary entry. This variable has three categories: entered within 7 months, delayed 8–20 months, and delayed more than 20 months.

Number of undergraduate credits earned in education and child care **EDUCCRED**

This variable was derived by summing the number of credits earned in the following aggregated course categories: family, child, and youth studies, education, special education, and teacher education subjects.

Number of undergraduate credits earned in engineering and related technology **ENGCRED**

This variable was derived by summing the number of credits earned in the following aggregated course categories: electrical and computer engineering, electronic engineering, and other engineering technologies.

Sex **F3SEX**

This variable identifies respondents as male or female.

Race/ethnicity **F3RACE**

This variable is based on self-report, with respondents being asked to mark one of the following options: Asian or Pacific Islander; Hispanic, regardless of race; Black, not of Hispanic origin; White, not of Hispanic origin; American Indian or Alaska Native; other.

Number of undergraduate credits earned in food service and hospitality **FOODCRED**

This variable was derived by taking the number of credits earned in the aggregated course category of food and food services.

Variable

Member of 12th-graders in 1992 **GRADE12A**

Derived from the variable for the membership of 1992 12th-graders (G12COHRT). This variable includes students who were not identified as a member in G12COHRT but had evidence of receiving high school diplomas between January and July 1992. This variable has two categories: 1992 member or not a member. It was used as a filter in this publication to select students who were in 12th grade in 1992.

Number of undergraduate credits earned in health care **HEACRED**

This variable was derived by summing the number of credits earned in the following aggregated course categories: medical therapies, other health services, nutrition, speech pathology and audiology, clinical health science, medicine and dentistry, nursing, and other health professions.

Highest level of mathematics in high school **HIGHMREV**

A transcript-based variable indicating the highest level of mathematics courses completed in high school. The categories used in this publication include calculus or precalculus, trigonometry, algebra II, geometry, algebra I, and other/no mathematics.

College preparatory program **HSCOLPRG**

Using the number of Carnegie units earned in English (HSENGREV), mathematics (HSMTHREV), science (HSSCIREV), social science (HSSSCREV), foreign language (HSFLNREV), biology (HSBIOREV), chemistry (HSCHMREV), and physics (HSPHYREV) and the highest level of mathematics completed in high school (HIGHMREV), this variable was derived to classify a student into one of three college preparatory curriculum programs:

Core curriculum	Students who earned 4 Carnegie units of English, 3 of mathematics, 3 of science, and 3 of social studies.
Mid-level curriculum	Students who exceeded the core curriculum by earning at least 2 Carnegie units of foreign language, by earning any units in geometry, and by earning any units in at least two of the following science courses: biology, chemistry, or physics.
Rigorous curriculum	Students who exceeded the core curriculum by earning 4 Carnegie units of mathematics (including credits in precalculus or higher), 3 of foreign language, and 3 of science (including credits in biology, chemistry, and physics).

High school curriculum concentration **HSPROG**

A variable derived by using HSCOLPRG and HSVOCCON to identify a student's high school curriculum concentration. This variable has six categories: core college preparatory, mid-level college preparatory, rigorous college preparatory, career and technical education (CTE) concentrator only, dual college preparatory and CTE concentrator, and general education student.

Career and technical education (CTE) concentration field **HSVOCCON**

This variable was derived by using the number of Carnegie units earned in high school grades 9 through 12 to classify a student into one of 10 broadly defined CTE fields: agriculture, business, marketing, health care, protective services, communications and technology, trade and industry, food service and hospitality, child care and education, and personal and other services. If a student earned 3 or more Carnegie units in one of these fields, the student was placed in this field. If a student earned 3 or more units in more than one field, the student was placed in the field in which he or she earned the most units. If a student earned the same number of units in two fields, the student was assigned to the first field of concentration listed above.

Number of undergraduate credits earned in marketing **MKTCRED**

This variable was derived by summing the number of credits earned in the following aggregated course categories: marketing, retail, and specialized marketing.

NELS enrollment status **NELSSTAT**

This is the sorting variable for students in the Fourth Follow-up who claimed to have attended a postsecondary institution at any time. This variable identifies students who have been placed into the following categories:

1. Received one or more transcripts, at least one of which was not either a GED-level/all basic skills transcript or a one-course transcript.
2. Either (a) one undergraduate transcript was imputed when a graduate transcript was received with the undergraduate school referenced—but the undergraduate transcript was not received, or (b) the primary institution of undergraduate attendance refused to send transcripts and in cases in which the account of attendance and degree attainment is credible and consistent.
3. Received one or more transcripts, but all were either GED-level and (if more than one received) one-course documents.
4. Received only one transcript with only one course or fewer than 5.0 attempted credits of any kind.
5. Transcript(s) requested, none received, but student is likely to be a postsecondary participant based on loan disbursement records in the National Student Loan Data System (NSLDS) file.
6. Transcript(s) requested, none received, but student is likely to be a postsecondary participant based on his or her account of attendance, postsecondary experiences, attainment, occupation, income, financing of postsecondary education, and high school background.
7. Student claimed postsecondary attendance but transcript was not requested, but student is likely to be a postsecondary participant based on either a loan disbursement in the NSDLS file or account of attendance, attainment, etc.
8. Transcript requested, but student is not likely to be a postsecondary participant because either (a) all received transcripts were out-of-scope (blank records or secondary school transcripts), or (b) the student's account of attendance, attainment, etc. was contradictory, insufficient, and not credible.
9. Student claimed postsecondary attendance but transcript was not requested, and student is not likely to be a postsecondary participant because the student's account of attendance, attainment, etc. was contradictory, insufficient, and not credible.
10. No claim of postsecondary attendance was made in either third follow-up (1994) or fourth follow-up (2000).

Variable

Number of undergraduate credits earned in career-related fields **OCCCRED**

This variable was derived by summing total numbers of credits earned in agriculture and natural resources (AGRCRED), business (BUSCRED), marketing (MKTCRED), health care (HEACRED), public and protective services (PUBCRED), communications and related technologies (COMMCRED), computer technology (COMPCRED), engineering and related technologies (ENGCRED), trade and industry (TRDCRED), food service and hospitality (FOODCRED), child care and education (EDUCCRED), and personal and other services (PERCRED).

Number of undergraduate credits earned in personal and other services **PERCRED**

This variable was derived by summing the number of credits earned in the following aggregated course categories: personal services (funeral services, cosmetology, manicure, massage) and textiles and clothing.

Enrollment status in 2000 **PERSIST**

This variable was derived from enrollment status in 2000 and highest degree attained, and it has three categories: attained a degree or certificate, attained no degree but still enrolled in 2000, and attained no degree and not enrolled in 2000.

Number of undergraduate credits earned in public and protective services **PUBCRED**

This variable was derived by summing the number of credits earned in the following aggregated course categories: law and paralegal, crime studies/services, public affairs/administration, and social work/human services.

Type of first institution enrolled **REFITYPE**

A transcript-based variable indicating aggregated Carnegie Class type of first institution attended. The variables used in this publication were collapsed into three categories: 4-year, community college, and other. Other institutions include private 2-year, public and private less-than-2-year, and unclassified institutions.

Earned an associate's degree in a field related to student's high school career and technical education (CTE) field **RELAA**

This variable was derived by aligning associate's degree major field (AAMAJOR) to high school CTE concentration field (HSVOCCON). This variable has three categories: no associate's degree or not CTE concentrator, CTE concentrator who earned an associate's degree in a related field, and CTE concentrator who did not earn an associate's degree in a related field.

Earned a bachelor's degree in a field related to student's high school career and technical education (CTE) field **RELBA**

This variable was derived by aligning bachelor's degree major field (BAMAJOR) to high school CTE concentration field (HSVOCCON). This variable has three categories: no bachelor's degree or not CTE concentrator, CTE concentrator who earned a bachelor's degree in a related field, and CTE concentrator who did not earn a bachelor's degree in a related field.

Earned a certificate in a field related to student's high school career and technical education (CTE) field **RELCER**

This variable was derived by matching certification major field (CERMAJOR) to high school CTE concentration field (HSVOCCON). This variable has three categories: no certificate or not CTE concentrator, CTE concentrator who earned certificate in a related field, and CTE concentrator who did not earn certificate in a related field.

Number of undergraduate credits earned in a field related to student's high school career and technical education (CTE) field **RELCRED**

This variable was made for CTE concentrators by summing total numbers of credits earned in agriculture and natural resources (AGRCRED), business (BUSCRED), marketing (MKTCRED), health care (HEACRED), public and protective services (PUBCRED), communications and related technologies (COMMCRED), computer technology (COMPCRED), engineering and related technologies (ENGCRED), trade and industry (TRDCRED), food service and hospitality (FOODCRED), child care and education (EDUCCRED), and personal and other services (PERCRED) if each field matches high school CTE concentration field.

Total undergraduate credits earned **TCREDB**

A transcript-based variable indicating additive undergraduate credits from all sources (including examination and dual enrollment, but not transfer).

Number of undergraduate credits earned in trade and industry **TRDCRED**

This variable was derived by summing the number of credits earned in the following aggregated course categories: building trades, mechanics and repair, engineering mechanics/mechanical engineering, other engineering, precision production, architecture, graphics and design, and transportation.

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Appendix B—Technical Notes

National Education Longitudinal Study of 1988

The National Education Longitudinal Study of 1988 (NELS:88) is a major longitudinal study sponsored by the U.S. Department of Education, National Center for Education Statistics (NCES). The study began in 1988 based on a sampling frame of 39,000 public and private schools with 8th grades and all of the 8th-grade students in those schools. From this sampling frame, a nationally representative, two-stage probability sample was selected consisting of 1,052 8th-grade schools (the primary sampling unit) and 26,432 8th-grade students (the second stage sampling unit) in these schools. Of the sampled students, 24,499 participated. Some students did not participate because they were deemed ineligible based on severe mental or physical disabilities or because they were not proficient in English. Some schools were also deemed ineligible for participation in NELS, including Bureau of Indian Affairs (BIA), U.S. Department of Interior schools, special education schools for students with disabilities, area vocational schools that did not enroll students directly, and schools for dependents of U.S. military personnel overseas.

Follow-ups were conducted in 1990, when most of the cohort members were in 10th grade; in 1992, when most of the cohort members were in 12th grade; and in 1994 and 2000, when most of the cohort members had been out of high school for 2 and 8 years, respectively.[1,2] In addition, the study was designed not only to follow a cohort of 8th-grade students over time but also to "freshen" the sample in the 1990 and 1992 surveys to obtain a nationally representative sample of students enrolled in 10th grade in 1990 and in 12th grade in 1992 that could be compared with the earlier cohorts from the National Longitudinal Study of the High School Class of 1972 (NLS:72) and the High School and Beyond Longitudinal Study (HS&B). The sample sizes for the follow-up surveys were approximately 22,000 for 1990, 21,000 for 1992, 16,000 for 1994, and 15,000 for 2000.

Along with the student survey, NELS:88 included surveys of parents, teachers, high school administrators, and high school dropouts. A majority of sample members also completed

[1] To meet budget constraints, students were subsampled in each follow-up.

[2] Students deemed ineligible to participate in the base year surveyed were reassessed for eligibility in the first and second follow-up, and if they were deemed eligible in these follow-ups they were included in those later surveys.

cognitive tests administered in 1988, 1990, and 1992. In 1992, high school transcripts were collected for sample members, and in 2000, postsecondary transcripts were collected, further increasing the analytic potential of the data. Consequently, NELS:88 represents an integrated system of data that tracked students from middle school through secondary and postsecondary education and examined their labor market experiences and marriage and family formation patterns between 1988 and 2000. For more technical information about the NELS:88 surveys, see the NELS:88/2000 user's manual (Curtin et al. 2002).

The NELS:88 High School and Postsecondary Education Transcript Studies

The major source of data for this publication came from the High School Transcript Study (HSTS) and Postsecondary Education Transcript Study (PETS) associated with NELS. The HSTS was conducted as a part of the NELS Second Follow-up in fall 1992. Transcript data spanning the 4 years of high school were collected for four groups of students: those attending the NELS Second Follow-up schools, dropouts who had attended high school for a minimum of one term, early graduates, and those who were enrolled in the 12th grade in spring 1992 but were identified as ineligible for the base-year through Second Follow-up surveys due to mental or physical disability or language barrier. A total of 17,285 transcripts were collected from 1,543 schools. The data include student-level information (such as number of days absent per school year and standardized test scores) as well as coursetaking information for each student. For more information about HSTS, see the *Second Follow-up: Transcript Component Data File User's Manual* (Ingels et al. 2002).

The PETS data were collected as a part of the NELS Fourth Follow-up survey in fall 2000. The PETS collected the transcripts from all U.S. postsecondary institutions attended by NELS sample members in the Fourth Follow-up. It supplements the postsecondary education information collected from the 1994 and 2000 follow-ups by including detailed information on the types of degree programs, periods of enrollment, majors or fields of study for instructional programs, specific courses taken, grades and credits attained, and credentials earned. Approximately 12,100 students participated in the NELS Fourth Follow-up in 2000 (Adelman, Daniel, and Berkovits 2003). Within this panel, about 9,600 students reported having attended at least one postsecondary institution according to either the Third Follow-up in 1994 or the Fourth Follow-up in 2000. Within this sample of students, the transcript data collection further targeted students who attended only postsecondary institutions identified in the Integrated Postsecondary Education Data System (IPEDS) institutional data file, which do not include foreign institutions

and noncredit-granting institutions.[3] Transcripts were requested from a total of 3,200 postsecondary institutions. A total of 14,880 transcripts were received and another 989 constructed from transfer credits indicated on received transcripts. Transcripts were received and/or constructed for 8,887 students. For more information about PETS, see *Postsecondary Attainment, Attendance, Curriculum, and Performance: Selected Results From the NELS:88/2000 Postsecondary Education Transcript Study (PETS), 2000* (Adelman, Daniel, and Berkovitz 2003).

Identifying Postsecondary Career-Related Coursework and Degrees for Career and Technical Education (CTE) Concentrators

This publication describes undergraduate credit and postsecondary degree attainment among 1992 12th-grade students who enrolled in postsecondary institutions, highlighting results for students who concentrated in CTE in high school. Postsecondary credits and degrees are identified as either "academic" or "career-related." Academic fields are defined as the traditional liberal arts and science fields: mathematics, sciences, English/letters, humanities, social sciences, fine and performing arts, and liberal studies. Career-related fields are defined as those associated with occupations such as engineering, education, and health care. As Hudson and Shafer (2004) explain, postsecondary career-related fields are

> designed to impart knowledge and skills that represent the relevant accumulated knowledge within the context of occupationally specific job requirements. The knowledge and skill imparted typically involves less theory, more application, and a narrower focus than what is taught in an academic major; they are also often explicitly linked to occupations skill demands (p. 1).

Hudson and Shafer's (2004) distinction between vocational and nonvocational career fields helps to elucidate the general category of career field, particularly for readers who may not be accustomed to considering coursework at the baccalaureate level to be career-related. They describe *vocational career fields* as

> A subset of career majors consisting of formal programs of study that impact knowledge and skills required for semiskilled, skilled, technical, and paraprofessional occupations that typically require education below the baccalaureate level (such as engineering technology) (p. 1).

[3] Although transcripts were not requested from foreign institutions, when a domestic transcript included transfer credits from a named foreign school, a separate transcript for those courses was created.

Hudson and Shafer describe *nonvocational career fields* as

> A subset of career majors consisting of formal programs of study that impact knowledge and skills required for technical and professional occupations that typically require education at the baccalaureate or higher level (such as engineering) (p. 1).

This publication examines the extent to which high school CTE concentrators studied a related career field at the postsecondary level. Thus, it takes the perspective of the secondary curriculum, and looks forward to the postsecondary level to consider which postsecondary courses and majors are most related to the high school CTE fields. In order to examine this issue of "relatedness," staff members for NCES Data on Vocational Education (DOVE) Technical Review Panel (TRP) and its Secondary School Taxonomy (SST) working group developed crosswalks between the 10 broad CTE fields identified in figure 1 and the postsecondary coursetaking and degree variables. Specifically, crosswalks were developed between the 10 CTE fields and (1) the NELS PETS "course aggregate" codes developed by Adelman (2004a) and published in *The Empirical Curriculum: Changes in Postsecondary Course-Taking, 1972–2000* and (2) the NELS PETS postsecondary major codes available on the NELS:2000 postsecondary transcript file. Only career-related postsecondary courses and majors were assigned to related high school CTE fields. Each career-related postsecondary course or major code was assigned to the one CTE concentration field determined to be most related to it. The two crosswalks are presented in appendix C. With each course and major being assigned to only one CTE field, the approach taken in this publication likely produces the most conservative estimate of "relatedness." This is due primarily to the difficulty, or impossibility, of capturing all courses that could conceivably be related to each CTE field. In discussing related courses, the term "core-related" course is used. "Core" is intended to communicate that other academic and career-related courses may be required for a given career-related major (e.g., an accounting course for an agriculture major), but the "core-related" courses are ones that are clearly linked to the student's high school career field.

The SST identifies 10 specific labor market preparation categories, three of which contain subfields (figure 1). For two of the categories with subfields (business, trade and industry) the analyses presented in this report consider the aggregate category because the subfields remain similar at the postsecondary level. However, for one, technology and communications, the analyses were conducted at the subfield level because the subfields seemed to diverge to a greater extent at the postsecondary level. For example, the subfield "communications and related technology" at the secondary level contains courses such as yearbook production, broadcast management, and telecommunications. At the secondary level, the course categories of journalism, mass communication, communication technology, and "communications: other" were all judged to be related to the high school CTE subfield of "communications and related

technology."[4] The other two subfields of technology and communications at the secondary level are "computer technology" and "other technology," which includes high school courses such as electronic technology and engineering technologies. Because the postsecondary courses and majors judged to be related to these subcategories (e.g., computer science, electrical engineering) seemed qualitatively different from the courses and majors of communications and related technologies, a decision was made to analyze the three subfields of communications and technology separately.

Analysis Sample

The sample for this analysis was obtained from a national sample of students who were in 12th grade in 1992 because that year marked the modal year of high school graduation for the initial NELS cohort. From this group, a subsample of students who had complete high school transcripts was selected because students' high school curriculum concentration, which is the focus of this publication, is built upon students' high school coursework. These two selection criteria yielded an unweighted sample of 9,038 students. This sample was used in tables 1–3, which present data on students' high school curriculum concentration and mathematics coursetaking. This sample was also used in the first column of table 4 that presents postsecondary enrollment rates among all 12th-graders. For the other columns in table 4 and in the remaining tables (tables 5–14), the sample was further restricted to 1992 12th-graders who enrolled in a postsecondary institution between 1992 and 2000 and had complete postsecondary transcript records. This restriction resulted in an analysis sample of 7,057 students, accounting for about 79 percent (unweighted) of all NELS 1992 12th-graders who entered postsecondary education from 1992 through 2000. Information about the sample included for each table is noted in the tables.

Bias Analysis

From the selected sample of this report, weighted item response rates were calculated for all variables used in this report by dividing the weighted number of valid responses by the weighted population for which the item was applicable. All variables had a high response rate (i.e., above 85 percent). Thus, it is unlikely that estimates and reported differences are biased because of missing data.

[4] Identifying these course categories as career-related rather than academic is consistent with analyses conducted by Hudson and Carey (2005) and Hudson and Shafer (2004).

Weights

Tables 1–3 focus on 12th-graders; thus, the weight variable WTP00 (F4F2HWT in the original data file) was used to generate nationally representative estimates for 12th-graders in 1992 who had complete high school transcripts. In table 4, the weight variable WTP00 was first used to generate the estimate for postsecondary enrollment rates of 12th-graders (first column), and the weight variable WTV00 (F4F2P2WT) was then used because the table focuses on both the time and type of first institution enrolled. For remaining tables, the weight variable WTT00 (F4F2HP3W) was used to generate the estimates for 1992 12th-graders who had enrolled in postsecondary education and had both complete high school and complete postsecondary transcript records.

Accuracy of Estimates

The statistics in this publication are estimates derived from a sample. Two broad categories of error occur in such estimates: sampling and nonsampling errors. Sampling errors occur because observations are made only on samples of students, not entire populations. Nonsampling errors occur not only in sample surveys but also in complete censuses of entire populations. Nonsampling errors can be attributed to a number of sources: inability to obtain complete information about all students in all institutions in the sample (some students or institutions refused to participate, or students participated but answered only certain items); ambiguous definitions; differences in interpreting questions; inability or unwillingness to give correct information; mistakes in recording or coding data; and other errors of collecting, processing, sampling, and imputing missing data.

Statistical Procedures

Differences Between Means and Percentages

The descriptive comparisons were tested in this publication using the Student's *t* statistic. Differences between estimates are tested against the probability of a Type I error,[5] or significance level. The significance levels were determined by calculating the Student's *t* values for the differences between each pair of means or proportions and comparing these with published tables of significance levels for two-tailed hypothesis testing.

[5] A Type I error occurs when one concludes that a difference observed in a sample reflects a true difference in the population from which the sample was drawn, when no such difference is present.

Student's *t* values may be computed to test the difference between estimates with the following formula:

$$t = \frac{E_1 - E_2}{\sqrt{se_1^2 + se_2^2}} \quad (1)$$

where E_1 and E_2 are the estimates to be compared and se_1 and se_2 are their corresponding standard errors. This formula is valid only for independent estimates. When estimates are not independent, a covariance term must be added to the formula:

$$t = \frac{E_1 - E_2}{\sqrt{se_1^2 + se_2^2 - 2(r)se_1\ se_2}} \quad (2)$$

where *r* is the correlation between the two estimates.[6] This formula is used when comparing two percentages from a distribution that adds to 100. For all of these tests, we conducted the most conservative test by setting *r* at –1. If the comparison is between the mean of a subgroup and the mean of the total group, the following formula is used:

$$t = \frac{E_{sub} - E_{tot}}{\sqrt{se_{sub}^2 + se_{tot}^2 - 2p\ se_{sub}^2}} \quad (3)$$

where *p* is the proportion of the total group contained in the subgroup. For all of these tests, we set *p* at –1.

There are hazards in reporting statistical tests for each comparison. First, comparisons based on large *t* statistics may appear to merit special attention. This can be misleading because the magnitude of the *t* statistic is related not only to the observed differences in means or percentages but also to the number of respondents in the specific categories used for comparison. Hence, a small difference compared across a large number of respondents would produce a large *t* statistic.

A second hazard in reporting statistical tests is the possibility that one can report a "false positive" or Type I error. A false positive occurs when the test statistic comparing estimates from sample survey data is found to be significant when there is no real difference in the characteristic between the subgroups within the population from which the sample is drawn. Statistical tests are designed to control this type of error, denoted by alpha. The alpha level of .05 selected for findings in this publication indicates that a difference of a certain magnitude or larger would be

[6] U.S. Department of Education, National Center for Education Statistics, *A Note from the Chief Statistician,* no. 2, 1993.

produced no more than 1 time out of 20 when there was no actual difference in the quantities in the underlying population. When we test hypotheses that show *t* values at the .05 level or smaller, we treat this finding as rejecting the null hypothesis that there is no difference between the two quantities. Finding no difference, however, does not necessarily imply the values are the same or equivalent.

Appendix C—Crosswalks of High School Career and Technical Education (CTE) Fields and Postsecondary Coursework and Majors

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Table C1. Crosswalk of high school curriculum areas and related postsecondary courses

High School Curriculum Areas (Based on the Secondary School Taxonomy)	Related Postsecondary Courses (Based on Course Aggregates)[1]
I. Career and Technical Education (CTE) Fields	
Agriculture and natural resources	Agriculture and natural resources 1-5 Agriculture and natural resources
Business Business services Business management	Business 10 Accounting 11 Finance, insurance, real estate 13 Business information technology 14 Business and management, other 15 Financial services support 16 Data and computer applications 18 Office occupations
Marketing	Marketing 12 Marketing 19 Retail, specialized marketing
Health care	Health care 39 Medical therapies 40 Health services, other 41 Nutrition 42 Speech pathology and audiology 43 Clinical health science 44 Medicine and dentistry 45 Nursing 46 Other health professions
Public and protective services	Public, social, human, and legal services 49 Law and paralegal 82 Crime studies/services 83 Public affairs/administration 84 Social work/human services
Technology and Communications Computer technology Communications technology Other technology	Technology and communications Computer science 17 Computer programming 25 Computer science Communications and related technologies 20 Journalism 21 Oral communication 22 Mass communication 23 Communications, other 24 Communication technologies Engineering and related technologies 30 Electrical and computer engineering 33 Electronic engineering 34 Engineering technologies, other

[1] The codes correspond to the 109 course aggregate codes from Adelman's (2004a) *The Empirical Curriculum*, pp. 123–137.

Table C1. Crosswalk of high school curriculum areas and related postsecondary courses—Continued

Trade and industry Construction Mechanics and repair Precision production Transportation	Trade and industry Construction trades 97 Building trades Mechanics, repair, and related engineering 98 Mechanics and repair 31 Engineering mechanics/mechanical engineering 32 Engineering, other Drafting, graphics, and other precision production 99 Precision production 6 Architecture 101 Graphics and design Transportation 100 Transportation
Food service and hospitality	Food and food services 48 Food and food services
Child care and education	Child care, education, and family studies Family, child, and youth studies 47 Family, child, and youth studies Education 27 Special education 28 Teacher education subjects 29 Education
Personal and other services	Personal and consumer services 26 Personal services (funeral services, cosmetology, manicure, massage) 102 Textiles and clothing
II. Academic Courses	
Mathematics	Mathematics 62 College-level math 63 Calculus and advanced mathematics 64 Statistics 65 Mathematics, other (includes technical and business math) 79 Social and economic statistics
Sciences	Sciences 57 General biology 58 Generalized sciences 59 Biology service courses 60 Biological sciences 75 Chemistry 76 Geology and earth science 77 Physics 78 Other physical sciences
English/letters	English/letters 53 Composition and writing 55 Literature/letters

Table C1. Crosswalk of high school curriculum areas and related postsecondary courses—Continued

	Humanities 35 Spanish language 36 Foreign languages, other 52 Classical studies 54 Linguistics and language study 71 Ethics 72 Bible Study 73 Theology 74 Philosophy and religious studies
Social sciences	Social sciences 7 U.S. History 8 Area studies 9 Ethnic/culture studies 67 Women's/gender studies 80 General psychology 81 Psychology, other 85 Interdisciplinary social science 86 Anthropology, archaeology 87 Introductory economics 88 Economics, other 89 Geography 90 Western civilization/world history 91 History, other 92 International relations 93 U.S./state government 94 Political science, other 95 Introduction to sociology 96 Sociology, other
Fine and performing arts	Fine and performing arts 103 Art history 104 Fine arts 105 Theater and dance 106 Film arts 107 Music performance 108 Music, other
	Liberal studies 56 Liberal arts 68 Science, technology, and society

Table C1. Crosswalk of high school curriculum areas and related postsecondary courses—Continued

III. Other Courses	
Enrichment/other	Other 37 Physical education and health information 38 Recreation, sports, and health-physical education-recreation (HPER) 50 Remedial English 51 Other remedial skills 61 Pre-collegiate math 66 Military science 69 Workplace and career development 70 Interpersonal and personal development 109 Orientations

Table C2. Crosswalk of high school curriculum areas and related postsecondary majors, by postsecondary certificate and degree

High School Curriculum Area	Major for Certification	Major for Associate's Degree	Major for Bachelor's Degree
AGRICULTURE AND NATURAL RESOURCES	Agricultural Business/Production	Agricultural Business/Production Agriculture/Animal/Plant Sciences Conservation/Natural Resources Forestry	Agricultural Business/Production Agriculture/Animal/Plant Sciences Conservation/Natural Resources Forestry
BUSINESS	Accounting Business Administration/Management Data/Information Management Medical Office Support Other Business Support Secretarial/Clerical	Accounting Business Administration/Management Data/Information Management Finance Medical Office Support Other Business Other Business Support Secretarial/Clerical	Accounting Business Administration/Management Data/Information Management Finance Human Resources Development/ Labor Relations Medical Office Support Operations Research/Administration Sciences Other Business Other Business Support
MARKETING	Marketing/Distribution Retailing	Marketing/Distribution Retailing	Marketing/Distribution Real Estate Retailing
HEALTH CARE	Allied Health: Other Dental Assistant/Hygiene Medical/Veterinarian Lab Technician/Assistant Nursing Practical Nursing Radiologic Technology Respiratory Therapist/Technician	Allied Health: Other Clinical Health Science Dental Assistant/Hygiene Medical/Veterinarian Lab Technician/Assistant Nursing Nutrition/Food Science Occupational Therapy Physical Therapy Radiologic Technology Respiratory Therapist/Technician	Allied Health: Other Clinical Health Science Dental Assistant/Hygiene Health/Hospital Administration Medical/Veterinarian Lab Technician/ Assistant Nursing Nutrition/Food Science Occupational Therapy Other Health Science/Professions Other Therapies Physical Therapy Public Health Speech Pathology/Audiology

Table C2. Crosswalk of high school curriculum areas and related postsecondary majors, by postsecondary certificate and degree—Continued

High School Curriculum Area	Major for Certification	Major for Associate's Degree	Major for Bachelor's Degree
PUBLIC AND PROTECTIVE SERVICES	Administration of Justice Fire Science Paralegal/Pre-Law Public Administration	Fire Science Human/Community Service Law Paralegal/Pre-Law Social Work	Human/Community Service Law Library/Archival Science Paralegal/Pre-Law Public Administration Social Work
TECHNOLOGY AND COMMUNICATIONS			
COMPUTER SCIENCE	Computer Programming Information Technologies	Computer Programming Computer Science Information Technologies	Computer Programming Computer Science Information Technologies
COMMUNICATIONS AND RELATED TECHNOLOGIES	Communications Technologies	Communications Communications Technologies Journalism	Communications Communications Technologies Journalism Radio/TV/Film
ENGINEERING	Computer Technology Engineering Technologies: Electrical Engineering Technology: Non-Electrical	Computer Technology Engineering Technologies: Electrical Engineering Technology: Non-Electrical	Chemical Engineering Civil Engineering Computer Engineering Computer Technology Electronic/Communications Engineering Engineering Technologies: Electrical Engineering Technology: Non-Electrical

Table C2. Crosswalk of high school curriculum areas and related postsecondary majors, by postsecondary certificate and degree—Continued

High School Curriculum Area	Major for Certification	Major for Associate's Degree	Major for Bachelor's Degree
TRADE AND INDUSTRY CONSTRUCTION	Construction	Construction	
MECHANICS AND REPAIR	Mechanics & Repair: Auto/Air Mechanics & Repair: Electronic Mechanics & Repair: Heating, Ventilation, Air Conditioning Mechanics & Repair: Other	Mechanics & Repair: Auto/Air Mechanics & Repair: Electronic Mechanics & Repair: Heating, Ventilation, Air Conditioning Mechanics & Repair: Other	Engineering: Other Mechanical Engineering
PRECISION PRODUCTION	Graphic/Industrial Design Graphic/Print Communications Precision Production: Other	Graphic/Industrial Design Graphic/Print Communications Interior Design Precision Production: Other	Graphic/Print Communications Architect/Environmental Design Interior Design Graphic/Industrial Design
TRANSPORTATION	Air Transport Other Transport	Air Transport	Air Transport
FOOD SERVICE AND HOSPITALITY	Culinary Arts/Food Management Hospitality Management	Culinary Arts/Food Management Hospitality Management	Culinary Arts/Food Management Hospitality Management
CHILD CARE AND EDUCATION	Child Study/Guidance Early Childhood Education	Child Study/Guidance Early Childhood Education Education: Other Elementary Education	Child Study/Guidance Early Childhood Education Education: Other Elementary Education Secondary Education Special Education
PERSONAL AND OTHER SERVICES	Cosmetology Other Personal Service	FCS & Other Human Ecology Other Personal Service Textiles/Fashion	FCS & Other Human Ecology Other Personal Service Textiles/Fashion
MATHEMATICS		Math Sciences/Statistics	Math Sciences/Statistics

Table C2. Crosswalk of high school curriculum areas and related postsecondary majors, by postsecondary certificate and degree—Continued

High School Curriculum Area	Major for Certification	Major for Associate's Degree	Major for Bachelor's Degree
SCIENCE		Biological Science: Other Chemistry Integrated/General Science	Biochemistry Biological Science: Other Biopsychology Chemistry Geology/Earth Science Integrated/General Science Physical Science: Other Physics
ENGLISH AND LETTERS			English/American Literature Letters: Other Writing: Creative/Technical
HUMANITIES	Foreign Languages Theology	Bible Studies Interdisciplinary Humanities	Bible Studies Foreign Languages Interdisciplinary Humanities Philosophy Religious Studies Theology

Table C2. Crosswalk of high school curriculum areas and related postsecondary majors, by postsecondary certificate and degree—Continued

High School Curriculum Area	Major for Certification	Major for Associate's Degree	Major for Bachelor's Degree
SOCIAL SCIENCES		History Psychology Social Science: General Sociology	American Studies/Civilization Anthropology/Archaeology Area Studies Clinical/Counseling Psychology Economics Environmental Studies Ethnic Studies Geography History International Relations Political Science Psychology Social Science: General Sociology Women's Studies
FINE AND PERFORMING ARTS		Drama, Speech Fine and Performing Arts: Other Fine Arts/Art History Music	Drama, Speech Film Arts Fine and Performing Arts: Other Fine Arts/Art History Music
LIBERAL STUDIES	Liberal/General Studies	Liberal/General Studies	Liberal/General Studies
OTHER	Health-Physical Education-Recreation (HPER) Other	Health-Physical Education-Recreation (HPER) Physical Education	Health-Physical Education-Recreation (HPER) Other Physical Education Recreation/Sports

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Appendix D—Standard Error Tables

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Table D1. Standard errors for table 1: Percentage distributions of 1992 12th-grade students, by high school curriculum concentration for total group of students, for career and technical education (CTE) concentrators, and for college preparatory concentrators

High school concentration	All students	Career and technical education (CTE) concentrators	College preparatory concentrators
Total	†	†	†
Career and technical education (CTE), total	0.89	†	†
CTE only	0.73	1.81	†
Dual CTE and college preparatory	0.47	1.81	†
Core curriculum	0.28	†	3.01
Mid-level curriculum	0.28	†	3.11
Rigorous curriculum	0.07	†	1.30
College preparatory only	1.07	†	†
Core curriculum	0.58	†	1.49
Mid-level curriculum	1.02	†	1.62
Rigorous curriculum	0.43	†	1.12
General education	1.05	†	†

† Not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/92), "Second Follow-up, High School Transcript Survey, 1992" and National Education Longitudinal Study of 1988 (NELS:88/2000), "Fourth Follow-up, Postsecondary Education Transcript Survey, 2000."

Table D2. Standard errors for table 2: Percentage distribution of 1992 12th-grade students who were career and technical education (CTE) concentrators, by CTE field

CTE field	Total	CTE concentrators only	Dual CTE and college preparatory concentrators
Total	†	†	†
Agriculture and natural resources	1.13	1.17	2.02
Business	1.69	1.80	3.52
Marketing	0.84	1.05	1.35
Health care	0.22	0.27	0.51
Public and protective services	0.08	0.06	0.27
Trade and industry	2.30	2.43	4.02
Technology and communications	0.79	0.89	1.80
Personal and other services	1.24	1.62	0.43
Food service and hospitality	0.38	0.48	0.25
Child care and education	0.34	0.42	0.35

† Not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/92), "Second Follow-up, High School Transcript Survey, 1992" and National Education Longitudinal Study of 1988 (NELS:88/2000), "Fourth Follow-up, Postsecondary Education Transcript Survey, 2000."

Table D3-A. Standard errors for table 3-A: Percentage of 1992 12th-grade students with selected demographic characteristics, by high school curriculum concentration

			Race/ethnicity							
	Sex					Asian/ Pacific	American Indian or	Socioeconomic status		
High school concentration	Male	Female	White	Black	Hispanic	Islander	Alaska Native	Low	Middle	High
Total	0.57	0.57	0.39	0.19	0.21	0.10	0.36	0.87	1.15	1.10
Career and technical education (CTE), total	2.22	2.22	1.61	1.52	1.29	0.82	0.32	1.76	2.02	1.16
CTE only	2.32	2.32	1.77	1.57	1.70	1.10	0.27	1.94	2.15	1.11
Dual CTE and college preparatory	4.58	4.58	3.15	2.30	1.11	1.05	1.08	2.98	3.85	2.50
College preparatory only	1.77	1.77	1.33	1.09	0.74	0.42	0.66	0.85	1.43	1.73
Core curriculum	3.39	3.39	3.76	2.64	2.05	0.51	2.92	2.42	3.73	4.69
Middle-level curriculum	2.28	2.28	2.06	1.96	0.93	0.57	0.22	1.08	1.86	2.22
Rigorous curriculum	3.03	3.03	3.51	2.13	1.16	1.96	†	0.86	3.78	3.55
General education	1.80	1.80	1.18	1.01	0.91	0.39	0.42	1.43	1.84	1.42

† Not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/92), "Second Follow-up, High School Transcript Survey, 1992" and National Education Longitudinal Study of 1988 (NELS:88/2000), "Fourth Follow-up, Postsecondary Education Transcript Survey, 2000."

Table D3-B. Standard errors for table 3-B: Percentage of 1992 12th-grade students with selected pre-high school academic characteristics, by high school curriculum concentration

	8th-grade reading/mathematics composite scores			Grades from 6th through 8th grade			
High school concentration	Low quartile	Middle two quartiles	High quartile	Mostly As	Mostly Bs	Mostly Cs	Mostly Ds
Total	1.00	1.04	1.19	0.83	1.09	0.96	0.14
Career and technical education (CTE), total	1.73	1.78	1.40	1.53	2.10	1.56	0.28
CTE only	2.22	2.08	1.41	1.63	2.23	1.63	0.39
Dual CTE and college preparatory	2.29	2.84	3.23	2.72	3.51	2.42	0.30
College preparatory only	1.40	1.54	1.64	1.69	1.43	1.57	0.09
Core curriculum	3.01	3.01	2.72	2.65	2.89	4.07	0.38
Middle-level curriculum	2.01	2.13	2.32	2.19	1.87	1.88	0.07
Rigorous curriculum	0.11	4.49	4.48	3.55	3.55	0.24	†
General education	1.71	1.77	2.09	1.29	1.66	1.81	0.30

† Not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/92), "Second Follow-up, High School Transcript Survey, 1992" and National Education Longitudinal Study of 1988 (NELS:88/2000), "Fourth Follow-up, Postsecondary Education Transcript Survey, 2000."

Table D4. Standard errors for table 4: Percentage distribution of 1992 12th-grade students according to highest level of mathematics completed in high school, by high school curriculum concentration

High school concentration	Other or no math	Algebra I	Geometry	Algebra II	Trigo-nometry	Calculus or pre-calculus
Total	0.47	0.85	0.95	1.10	0.79	0.67
Career and technical education (CTE), total	1.25	1.67	1.61	1.60	1.10	0.78
CTE only	1.72	1.93	2.11	1.81	0.83	0.59
Dual CTE and college preparatory	0.97	2.41	2.49	3.20	2.72	2.16
College preparatory only	0.20	0.69	0.72	1.62	1.52	1.26
Core curriculum	0.88	2.92	1.92	3.57	4.08	1.47
Middle-level curriculum	†	†	0.83	2.38	2.07	1.68
Rigorous curriculum	†	†	†	†	†	†
General education	0.85	1.72	1.93	1.83	0.85	0.89

† Not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/92), "Second Follow-up, High School Transcript Survey, 1992" and National Education Longitudinal Study of 1988 (NELS:88/2000), "Fourth Follow-up, Postsecondary Education Transcript Survey, 2000."

Table D5. Standard errors for table 5: Percentage of 1992 12th-grade students who enrolled in postsecondary education between 1992 and 2000, and among those enrolled, percentage distribution of the elapsed time between high school graduation and postsecondary enrollment and the type of first institution enrolled, by high school curriculum concentration

		Among those enrolled					
		Time between high school graduation and postsecondary enrollment			Type of first institution enrolled		
High school concentration	Percentage of students who enrolled	Entered within 7 months	Delayed 8–20 months	Delayed 20 months or more	4-year	Community college	Other
Total	1.20	0.89	0.69	0.45	1.40	1.35	0.29
Career and technical education (CTE), total	1.78	2.41	1.87	1.60	2.25	2.30	0.66
CTE only	2.05	2.97	2.41	1.99	2.92	2.95	1.09
Dual CTE and college preparatory	3.81	2.72	2.33	1.57	3.70	3.96	1.15
College preparatory only	1.11	0.86	0.65	0.54	1.52	1.54	0.40
Core curriculum	2.64	2.19	1.31	1.83	3.43	3.45	1.49
Middle-level curriculum	1.48	1.09	0.76	0.71	1.96	2.01	0.38
Rigorous curriculum	2.83	0.45	0.25	0.36	1.24	1.16	0.40
General education	2.31	1.54	1.34	0.81	2.06	2.14	0.74

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/92), "Second Follow-up, High School Transcript Survey, 1992" and National Education Longitudinal Study of 1988 (NELS:88/2000), "Fourth Follow-up, Postsecondary Education Transcript Survey, 2000."

Table D6. Standard errors for table 6: Undergraduate total, academic, and career-related credits earned as of 2000 by 1992 12th-grade students who enrolled in postsecondary education between 1992 and 2000, by high school curriculum concentration and institution type

	Total undergraduate credits				Undergraduate academic credits					Undergraduate career-related credits				
		Percentage distribution				Percentage distribution					Percentage distribution			
High school concentration	Mean	0–10	11–59	60 or more	Mean	0–10	11–59	60 or more	Percent of total credits	Mean	0–10	11–59	60 or more	Percent of total credits
Total	1.43	0.36	1.00	1.12	1.04	0.98	1.02	1.10	0.52	0.65	1.09	1.31	1.06	0.52
Career and technical education (CTE), total	2.38	1.78	1.88	2.37	1.52	2.56	2.61	1.80	1.20	1.25	2.57	2.70	1.87	1.20
CTE only	3.06	2.55	2.63	3.23	2.12	3.37	3.08	2.22	1.64	1.53	3.63	3.34	1.88	1.64
Dual CTE and college preparatory	4.28	1.23	3.71	3.88	3.17	2.64	3.56	3.75	1.59	1.87	3.54	4.63	3.11	1.59
College preparatory only	1.49	0.23	0.94	0.97	1.14	0.69	1.23	1.35	0.65	0.93	1.30	1.88	1.69	0.65
Core curriculum	3.70	0.77	3.44	3.36	2.72	2.86	3.50	3.79	1.82	1.94	3.51	4.11	2.35	1.82
Middle-level curriculum	1.50	0.24	0.86	0.86	1.23	0.54	1.64	1.72	0.80	1.18	1.33	2.28	2.32	0.80
Rigorous curriculum	2.67	0.16	1.27	1.30	1.96	0.16	3.32	3.33	1.74	2.74	4.47	3.41	3.45	1.74
General education	2.35	0.88	2.35	2.16	1.87	1.67	2.24	1.95	1.01	1.06	2.30	2.18	1.19	1.01
Among those who initially enrolled in 4-year institution														
Total	1.38	0.18	1.00	1.02	1.00	0.39	1.29	1.22	0.60	0.86	1.51	1.42	1.11	0.60
Career and technical education (CTE), total	4.02	0.71	3.76	3.62	3.10	1.73	3.86	3.88	1.67	2.08	3.65	3.94	2.84	1.67
CTE only	6.11	1.17	5.28	5.34	5.00	3.31	5.25	6.04	3.01	2.99	4.83	4.60	3.64	3.01
Dual CTE and college preparatory	6.96	0.60	6.19	6.21	4.90	1.03	5.88	5.76	1.54	3.00	5.41	5.87	4.45	1.54
College preparatory only	1.23	0.17	0.73	0.79	1.09	0.57	1.34	1.31	0.71	0.87	1.42	1.85	1.35	0.71
Core curriculum	3.77	0.69	2.35	2.56	3.30	3.58	5.12	3.67	2.84	2.42	4.06	4.49	3.01	2.84
Middle-level curriculum	1.23	0.18	0.65	0.70	1.21	0.32	1.43	1.45	0.60	0.90	1.14	2.26	1.77	0.60
Rigorous curriculum	2.77	†	1.27	1.27	2.16	†	3.56	3.56	1.80	2.81	4.60	3.49	3.50	1.80
General education	3.57	0.39	3.15	3.06	2.52	0.69	2.91	2.87	1.31	2.00	3.45	2.68	2.34	1.31

See notes at end of table.

Table D6. Standard errors for table 6: Undergraduate total, academic, and career-related credits earned as of 2000 by 1992 12th-grade students who enrolled in postsecondary education between 1992 and 2000, by high school curriculum concentration and institution type—Continued

	Total undergraduate credits				Undergraduate academic credits					Undergraduate career-related credits				
		Percentage distribution				Percentage distribution					Percentage distribution			
High school curriculum concentration	Mean	0–10	11–59	60 or more	Mean	0–10	11–59	60 or more	Percent of total credits	Mean	0–10	11–59	60 or more	Percent of total credits
Among those who initially enrolled in community college														
Total	3.07	1.04	1.97	2.45	2.14	2.54	2.15	2.33	1.16	1.33	2.31	2.70	2.23	1.16
Career and technical education (CTE), total	3.08	3.08	3.50	3.40	1.88	3.86	3.48	2.11	1.56	1.55	3.39	3.17	2.12	1.56
CTE only	3.35	3.88	3.99	4.02	1.95	4.49	4.23	1.87	1.88	1.83	4.51	3.98	2.48	1.88
Dual CTE and college preparatory	6.57	3.31	5.06	5.58	4.12	5.68	4.90	5.90	3.31	2.98	5.00	5.13	4.14	3.31
College preparatory only	5.04	0.75	2.89	3.11	3.53	2.43	3.99	4.33	1.61	2.96	2.78	5.25	5.91	1.61
Core curriculum	5.65	1.69	6.07	5.96	3.27	5.23	5.93	7.12	2.00	2.99	5.25	6.87	3.45	2.00
Middle-level curriculum	6.67	0.88	3.17	3.41	4.87	2.03	6.03	6.64	2.55	4.33	3.79	6.14	7.83	2.55
Rigorous curriculum	10.34	3.18	6.98	7.21	8.02	3.18	9.17	9.27	4.22	6.73	6.94	8.14	8.02	4.22
General education	3.87	1.50	3.60	3.55	2.98	3.74	3.58	3.23	1.99	1.50	3.72	3.50	1.00	1.99

† Not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/92), "Second Follow-up, High School Transcript Survey, 1992" and National Education Longitudinal Study of 1988 (NELS:88/2000), "Fourth Follow-up, Postsecondary Education Transcript Survey, 2000."

Table D7. Standard errors for table 7: Percentage of students who earned any undergraduate credits in specific career-related fields among 1992 12th-graders who enrolled in postsecondary education between 1992 and 2000, by high school curriculum concentration and institution type

High school concentration	Agriculture and natural resources	Business	Marketing	Technology and communications: Communications and related technology	Technology and communications: Computer science	Technology and communications: Engineering and related technology	Education and child care	Health care	Public and protective services	Personal and other services	Trade and industry	Food service and hospitality
Total	0.88	1.11	1.09	1.12	0.74	0.61	0.73	0.87	0.79	0.28	0.90	0.28
Career and technical education (CTE), total	1.08	2.18	1.29	2.04	1.64	1.59	1.16	1.68	1.35	0.63	1.97	0.40
CTE only	1.04	2.93	1.38	2.22	1.99	1.95	1.35	2.35	1.78	0.98	2.15	0.36
Dual CTE and college preparatory	2.13	3.83	2.94	2.84	2.83	2.18	2.86	3.07	2.30	0.57	3.41	1.15
College preparatory only	1.67	1.32	1.77	1.24	1.07	0.98	1.25	1.67	1.18	0.38	1.11	0.36
Core curriculum	5.27	3.42	4.63	3.20	2.32	2.39	3.38	3.17	2.19	0.50	1.88	0.42
Middle-level curriculum	1.73	2.10	1.86	1.49	1.37	1.52	1.79	2.03	1.58	0.59	1.71	0.52
Rigorous curriculum	2.34	3.32	2.30	2.86	2.52	2.15	3.01	3.09	2.00	0.48	3.12	0.48
General education	1.03	2.11	1.72	1.96	1.58	1.13	1.03	1.45	1.68	0.37	2.35	0.66
Among those who initially enrolled in 4-year institution												
Total	0.84	1.30	0.85	0.95	0.98	0.88	1.00	1.32	0.81	0.41	1.11	0.34
Career and technical education (CTE), total	2.37	2.90	2.06	2.26	2.17	2.31	2.60	2.55	2.35	1.40	2.97	0.54
CTE only	2.73	5.41	2.05	3.62	2.19	4.33	3.25	4.00	3.25	2.77	3.34	0.65
Dual CTE and college preparatory	3.73	4.68	4.01	3.64	3.54	3.04	3.66	3.50	3.21	0.71	5.31	1.02
College preparatory only	1.12	1.27	1.14	1.17	1.23	1.19	1.43	1.78	1.24	0.53	1.21	0.42
Core curriculum	4.29	3.77	1.89	3.45	2.76	3.88	4.13	3.59	3.27	0.88	2.60	0.45
Middle-level curriculum	1.17	1.77	1.44	1.43	1.81	1.69	2.00	2.34	1.47	0.82	1.69	0.66
Rigorous curriculum	2.44	3.31	2.26	2.85	2.40	2.13	3.18	3.20	2.05	0.25	3.16	0.50
General education	1.18	3.46	2.11	2.22	2.38	2.04	2.10	2.72	1.66	0.58	3.41	0.69

See notes at end of table.

Table D7. Standard errors for table 7: Percentage of students who earned any undergraduate credits in specific career-related fields among 1992 12th-graders who enrolled in postsecondary education between 1992 and 2000, by high school curriculum concentration and institution type—Continued

High school curriculum concentration	Agriculture and natural resources	Business	Marketing	Technology and communications: Communications and related technology	Technology and communications: Computer science	Technology and communications: Engineering and related technology	Education and child care	Health care	Public and protective services	Personal and other services	Trade and industry	Food service and hospitality
Among those who initially enrolled in community college												
Total	2.03	2.25	2.63	2.38	1.26	0.94	1.29	2.09	1.67	0.23	1.95	0.59
Career and technical education (CTE), total	1.46	3.23	1.55	2.90	2.94	2.15	1.72	2.77	1.87	0.26	3.36	0.38
CTE only	1.27	4.02	1.59	2.74	2.91	2.43	1.91	3.28	2.01	0.25	3.40	0.50
Dual CTE and college preparatory	5.04	6.87	4.51	5.87	5.83	3.54	5.80	5.25	5.08	0.73	5.31	0.37
College preparatory only	6.22	3.13	5.93	3.24	2.30	2.23	3.24	5.16	2.36	0.27	4.40	0.50
Core curriculum	10.58	6.12	10.21	5.74	3.42	2.13	5.25	5.72	2.93	†	2.84	0.84
Middle-level curriculum	7.13	4.98	6.57	3.87	3.04	3.71	4.65	6.65	3.73	0.47	6.88	0.62
Rigorous curriculum	6.14	9.79	9.48	9.93	11.28	7.51	5.67	11.70	7.57	4.43	11.65	1.12
General education	1.75	3.44	3.99	3.94	1.62	0.85	1.71	3.30	3.04	0.43	2.72	1.20

† Not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/92), "Second Follow-up, High School Transcript Survey, 1992" and National Education Longitudinal Study of 1988 (NELS:88/2000), "Fourth Follow-up, Postsecondary Education Transcript Survey, 2000."

Table D8. Standard errors for table 8: Average number of undergraduate credits earned in specific career-related fields among 1992 12th-graders who enrolled in postsecondary education between 1992 and 2000 and who took a course in the field, by high school curriculum concentration and institution type

High school concentration	Agriculture and natural resources	Business	Marketing	Technology and communications: Communications and related technology	Technology and communications: Computer science	Technology and communications: Engineering and related technology	Education and child care	Health care	Public and protective services	Personal and other services	Trade and industry	Food service and hospitality
Total	1.28	0.50	0.30	0.51	0.56	1.32	0.67	1.24	0.67	1.67	1.07	1.71
Career and technical education (CTE), total	1.90	1.06	0.43	0.95	0.85	1.45	1.99	1.86	1.14	†	1.81	†
CTE only	2.82	1.45	0.49	1.06	1.22	2.31	1.73	2.66	1.23	†	2.11	†
Dual CTE and college preparatory	2.77	1.73	0.83	1.47	1.31	2.08	3.78	3.42	2.31	†	2.88	†
College preparatory only	2.11	0.97	0.40	0.68	0.62	2.07	1.04	2.17	0.98	1.83	1.38	2.20
Core curriculum	1.88	2.65	0.60	1.13	0.84	3.32	2.89	1.47	1.81	†	1.65	†
Middle-level curriculum	3.16	0.93	0.55	0.74	0.98	2.45	1.07	2.92	1.18	1.76	2.35	3.82
Rigorous curriculum	1.08	2.16	0.65	1.92	0.86	4.80	2.52	4.04	1.65	†	2.30	†
General education	0.78	0.71	0.41	0.87	1.59	2.55	1.10	1.36	0.81	2.64	2.02	3.60
Among those who initially enrolled in 4-year institution												
Total	0.72	0.45	0.34	0.55	0.80	1.38	0.74	1.09	0.87	2.30	1.44	2.70
Career and technical education (CTE), total	2.81	1.74	0.82	1.18	1.41	3.54	3.23	4.73	1.80	†	2.92	†
CTE only	4.23	1.77	0.60	1.47	2.64	7.17	2.72	7.84	1.63	†	3.98	†
Dual CTE and college preparatory	4.23	2.52	1.30	1.91	1.92	3.09	4.72	6.52	3.69	†	4.70	†
College preparatory only	0.77	0.72	0.44	0.78	0.72	1.73	1.11	1.42	1.07	1.46	1.51	2.67
Core curriculum	2.15	1.25	0.59	1.42	1.20	5.04	3.21	1.99	2.53	†	2.28	†
Middle-level curriculum	0.99	0.91	0.61	0.91	1.17	1.58	1.18	1.47	1.26	1.48	2.30	4.03
Rigorous curriculum	1.14	2.14	0.71	2.01	1.02	4.47	2.62	4.35	1.76	†	2.53	†
General education	1.08	1.05	0.66	0.81	2.67	4.15	1.44	1.92	1.36	5.78	2.42	†

See notes at end of table.

Table D8. Standard errors for table 8: Average number of undergraduate credits earned in specific career-related fields among 1992 12th-graders who enrolled in postsecondary education between 1992 and 2000 and who took a course in the field, by high school curriculum concentration and institution type—Continued

High school curriculum concentration	Agriculture and natural resources	Business	Marketing	Technology and communications: Communications and related technology	Technology and communications: Computer science	Technology and communications: Engineering and related technology	Education and child care	Health care	Public protective services	Personal and other services	Trade and industry	Food service and hospitality
Among those who initially enrolled in community college												
Total	3.53	1.02	0.71	0.93	0.44	2.87	1.13	2.99	0.90	3.85	1.98	2.79
Career and technical education (CTE), total	2.71	1.50	0.60	1.38	0.66	2.72	2.88	1.46	1.95	†	2.19	†
CTE only	2.75	1.78	0.74	1.36	0.88	3.06	3.95	1.98	2.03	†	2.56	†
Dual CTE and college preparatory	†	1.91	†	†	1.39	4.63	†	2.57	3.27	†	2.52	†
College preparatory only	7.37	2.82	1.29	0.87	0.89	8.35	2.27	6.57	1.94	†	3.70	†
Core curriculum	4.21	5.52	0.81	1.18	0.82	†	5.03	2.44	2.10	†	2.28	†
Middle-level curriculum	10.56	2.21	1.86	1.18	1.02	10.49	2.14	8.60	3.15	†	5.39	†
Rigorous curriculum	†	†	†	†	†	†	†	†	†	†	†	†
General education	0.76	0.99	0.89	1.84	0.68	2.51	1.47	1.56	0.96	4.27	3.78	†

† Not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/92), "Second Follow-up, High School Transcript Survey, 1992" and National Education Longitudinal Study of 1988 (NELS:88/2000), "Fourth Follow-up, Postsecondary Education Transcript Survey, 2000."

Table D9. Standard errors for table 9: Percentage distribution of postsecondary attainment and enrollment status in 2000 among 1992 12th-grade students who enrolled in postsecondary education between 1992 and 2000, by high school curriculum concentration

		Highest postsecondary credential as of 2000			No degree						
						Credits earned				Enrollment in 2000	
High school concentration	Earned any postsecondary credential	Certificate	Associate's	Bachelor's or higher	Total	0–10	11–29	30–59	60 or more	Enrolled	Not enrolled
Total	0.94	0.67	0.78	1.20	0.94	0.49	0.92	0.51	0.72	0.50	0.94
Career and technical education (CTE), total	2.10	0.98	2.14	1.70	2.10	1.87	1.77	1.53	1.44	1.20	2.28
CTE only	3.02	1.49	2.45	1.82	3.02	2.53	2.33	1.89	1.84	1.60	3.17
Dual CTE and college preparatory	3.27	1.26	2.62	3.08	3.27	3.64	2.05	2.41	1.29	1.00	3.55
College preparatory only	1.62	1.29	1.02	1.74	1.62	0.35	0.72	0.70	1.23	0.59	1.48
Core curriculum	3.74	1.38	2.47	3.61	3.74	1.02	2.91	1.44	1.92	1.09	3.78
Middle-level curriculum	2.22	1.97	1.22	2.61	2.22	0.34	0.72	0.79	2.09	1.04	1.90
Rigorous curriculum	2.23	0.18	1.00	2.40	2.23	0.76	0.72	1.72	1.55	1.43	1.85
General education	2.30	0.88	1.24	1.98	2.30	1.04	2.37	0.76	1.16	1.20	2.27

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/92), "Second Follow-up, High School Transcript Survey, 1992" and National Education Longitudinal Study of 1988 (NELS:88/2000), "Fourth Follow-up, Postsecondary Education Transcript Survey, 2000."

Table D10. Standard errors for table 10: Percentage distribution of certificate majors among 1992 12th-grade students who had earned a certificate by 2000, by high school curriculum concentration

	Career-related fields													
							Technology and communications							
High school concentration	Total	Agriculture and natural resources	Business	Marketing	Health care	Public and protective services	Communications and related technologies	Computer science	Engineering	Trade and industry	Food service and hospitality	Education and child care	Personal and other services	Other field
Total	0.51	0.43	4.14	0.45	7.95	1.15	0.35	0.43	1.26	4.90	1.94	1.30	1.31	0.30
Career and technical education (CTE), total	†	1.38	4.59	†	6.36	1.78	1.05	†	0.83	6.11	4.55	1.43	1.47	†
CTE only	†	1.41	5.44	†	7.44	1.62	1.25	†	0.99	6.06	5.57	1.77	1.84	†
Dual CTE and college preparatory	†	†	†	†	†	†	†	†	†	†	†	†	†	†
College preparatory only	1.04	†	6.53	†	19.57	2.99	0.63	1.11	4.72	7.55	2.20	1.30	1.27	†
Core curriculum	†	†	8.86	†	16.99	4.92	†	1.90	3.19	13.13	†	2.54	†	†
Middle-level curriculum	†	†	10.41	†	26.23	4.93	1.10	1.45	7.27	7.70	3.65	†	2.30	†
Rigorous curriculum	†	†	†	†	†	†	†	†	†	†	†	†	†	†
General education	0.92	0.77	6.34	1.05	4.47	1.66	0.32	1.01	0.51	7.72	3.24	2.76	2.80	0.72

† Not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/92), "Second Follow-up, High School Transcript Survey, 1992" and National Education Longitudinal Study of 1988 (NELS:88/2000), "Fourth Follow-up, Postsecondary Education Transcript Survey, 2000."

Table D11-A. Standard errors for table 11-A: Percentage distribution of associate's degree majors among 1992 12th-grade students who had earned an associate's degree by 2000, by high school curriculum concentration: Academic fields

	Academic fields							
High school concentration	Total	Mathematics	Science	English	Humanities	Social sciences	Fine and performing arts	Liberal studies
Total	2.63	†	0.80	†	0.19	0.48	0.33	2.43
Career and technical education (CTE), total	5.17	†	0.56	†	0.32	0.48	0.57	5.35
CTE only	6.38	†	0.69	†	†	0.50	0.72	6.78
Dual CTE and college preparatory	8.74	†	0.96	†	0.97	1.05	1.08	8.62
College preparatory only	4.89	†	1.10	†	0.44	1.61	0.35	4.23
Core curriculum	7.38	†	2.95	†	†	5.04	0.86	6.90
Middle-level curriculum	5.41	†	1.12	†	0.70	1.04	0.39	5.16
Rigorous curriculum	†	†	†	†	†	†	†	†
General education	5.74	†	1.67	†	0.04	1.50	0.81	4.62

† Not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/92), "Second Follow-up, High School Transcript Survey, 1992" and National Education Longitudinal Study of 1988 (NELS:88/2000), "Fourth Follow-up, Postsecondary Education Transcript Survey, 2000."

Table D11-B. Standard errors for table 11-B: Percentage distribution of associate's degree majors among 1992 12th-grade students who had earned an associate's degree by 2000, by high school curriculum concentration: Career-related fields

	Career-related fields													
							Technology and communications							
High school concentration	Total	Agriculture and natural resources	Business	Marketing	Health care	Public and protective services	Communications and related technologies	Computer science	Engineering	Trade and industry	Food service and hospitality	Education and child care	Personal and other services	Other field
Total	2.60	0.24	2.20	0.53	2.15	1.05	0.28	0.88	1.62	2.79	0.40	0.65	0.19	0.11
Career and technical education (CTE), total	5.17	0.93	5.69	0.52	2.82	2.40	0.13	0.99	2.66	1.70	0.64	1.79	0.42	†
CTE only	6.38	1.43	7.53	0.71	3.70	1.83	0.18	1.26	3.28	2.10	0.86	2.61	0.00	†
Dual CTE and college preparatory	8.74	†	6.86	0.50	5.04	5.28	†	1.50	4.03	2.05	1.20	0.77	1.38	†
College preparatory only	4.74	0.44	2.38	1.22	4.67	2.12	0.61	0.98	3.53	0.97	0.81	0.64	0.25	0.25
Core curriculum	7.38	0.82	2.81	0.77	3.00	3.85	1.25	0.14	10.78	1.86	1.27	1.13	0.88	†
Middle-level curriculum	5.27	0.40	3.48	1.82	6.58	1.87	0.73	1.52	1.37	1.30	1.04	0.78	†	0.38
Rigorous curriculum	†	†	†	†	†	†	†	†	†	†	†	†	†	†
General education	5.73	0.26	2.61	0.43	2.46	2.07	0.36	2.25	1.07	7.46	0.95	0.47	0.38	0.17

† Not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/92), "Second Follow-up, High School Transcript Survey, 1992" and National Education Longitudinal Study of 1988 (NELS:88/2000), "Fourth Follow-up, Postsecondary Education Transcript Survey, 2000."

Table D12-A. Standard errors for table 12-A: Percentage distribution of bachelor's degree majors among 1992 12th-grade students who had earned a bachelor's degree by 2000, by high school curriculum concentration: Academic fields

	Academic fields							
High school concentration	Total	Mathematics	Science	English	Humanities	Social sciences	Fine and performing arts	Liberal studies
Total	1.30	0.39	0.64	0.41	0.55	0.84	0.88	0.13
Career and technical education (CTE), total	2.98	0.62	1.46	1.55	1.17	2.36	0.43	†
CTE only	4.80	0.46	2.16	1.37	†	4.26	1.05	†
Dual CTE and college preparatory	4.04	0.99	1.86	2.42	1.93	2.58	†	†
College preparatory only	1.74	0.59	0.79	0.66	0.76	1.10	0.69	0.12
Core curriculum	4.65	0.55	1.45	1.03	0.60	2.73	1.86	0.46
Middle-level curriculum	2.09	0.90	1.00	0.58	0.37	1.59	1.01	0.15
Rigorous curriculum	3.74	0.66	2.36	2.20	3.52	2.43	1.30	0.05
General education	2.56	0.35	1.01	0.89	0.97	1.54	2.98	0.37

† Not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/92), "Second Follow-up, High School Transcript Survey, 1992" and National Education Longitudinal Study of 1988 (NELS:88/2000), "Fourth Follow-up, Postsecondary Education Transcript Survey, 2000."

Table D12-B. Standard errors for table 12-B: Percentage distribution of bachelor's degree majors among 1992 12th-grade students who had earned a bachelor's degree by 2000, by high school curriculum concentration: Career-related fields

	Career-related fields													
							Technology and communications							
High school concentration	Total	Agriculture and natural resources	Business	Marketing	Health care	Public and protective services	Communications and related technologies	Computer science	Engineering	Trade and industry	Food service and hospitality	Education and child care	Personal and other services	Other field
Total	1.34	0.36	1.17	0.39	0.84	0.42	0.54	0.51	0.54	0.36	0.11	0.72	0.17	0.49
Career and technical education (CTE), total	3.44	1.29	2.99	1.39	1.99	1.73	1.46	1.02	1.31	1.46	0.57	2.12	0.17	1.53
CTE only	5.49	1.61	4.38	1.63	4.69	1.21	2.21	1.41	2.09	2.40	0.53	2.18	0.17	1.49
Dual CTE and college preparatory	4.66	1.82	3.52	1.90	0.72	3.08	1.57	1.29	1.51	1.90	0.89	3.28	0.27	2.49
College preparatory only	1.75	0.43	1.75	0.65	0.97	0.57	0.65	0.30	0.76	0.45	0.14	1.05	0.23	0.62
Core curriculum	5.97	1.34	9.46	0.88	1.07	1.68	1.11	0.43	1.28	1.45	0.48	3.37	0.79	3.96
Middle-level curriculum	2.23	0.57	1.04	0.95	1.29	0.68	0.73	0.38	1.11	0.66	0.20	1.33	0.21	0.54
Rigorous curriculum	3.86	0.74	2.20	1.05	1.71	0.55	1.81	0.42	1.54	0.87	0.19	1.22	0.44	0.31
General education	2.60	0.41	1.99	0.67	2.08	0.79	1.33	1.72	0.62	0.51	0.16	1.16	0.37	1.23

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/92), "Second Follow-up, High School Transcript Survey, 1992" and National Education Longitudinal Study of 1988 (NELS:88/2000), "Fourth Follow-up, Postsecondary Education Transcript Survey, 2000."

Table D13. Standard errors for table 13: Percentage of 1992 12th-grade students who were career and technical education (CTE) concentrators and earned various amounts of undergraduate credits in a related career field among those who enrolled in postsecondary education between 1992 and 2000, by high school CTE field

High school CTE field	Any credit	3 or more credits	6 or more credits	9 or more credits	12 or more credits
Total	2.51	2.58	2.36	2.26	2.08
Agriculture and natural resources	5.59	5.18	4.54	4.40	4.36
Business	2.49	3.28	3.79	3.56	3.21
Marketing	7.28	7.28	5.01	4.03	2.76
Health care	†	†	†	†	†
Public and protective services	†	†	†	†	†
Trade and industry	4.51	4.50	4.47	4.06	3.43
Technology and communications	7.12	6.98	5.35	4.79	5.25
Personal and other services	3.37	3.37	3.37	3.37	3.37
Food service and hospitality	†	†	†	†	†
Child care and education	†	†	†	†	†

† Not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/92), "Second Follow-up, High School Transcript Survey, 1992" and National Education Longitudinal Study of 1988 (NELS:88/2000), "Fourth Follow-up, Postsecondary Education Transcript Survey, 2000."

Table D14. Standard errors for table 14: Percentage of 1992 12th-grade students who were career and technical education (CTE) concentrators and earned a postsecondary degree or certificate among students who enrolled in postsecondary education between 1992 and 2000 and percentage whose degree or certificate was in a related career field between 1992 and 2000, by high school CTE field

	Earned a degree or certificate		Earned a certificate		Earned an associate's degree		Earned a bachelor's degree	
High school CTE field	Total	In a related field among those who earned a degree or certificate	Total	In a related field among those who earned a certificate	Total	In a related field among those who earned an associate's degree	Total	In a related field among those who earned a bachelor's degree
Total	2.10	2.34	0.91	5.66	2.57	3.36	1.70	3.66
Agriculture and natural resources	5.27	6.11	2.74	†	4.18	†	7.37	†
Business	4.28	3.94	1.48	11.93	4.73	8.38	3.03	4.40
Marketing	8.22	†	4.11	†	4.53	†	6.96	†
Health care	†	†	†	†	†	†	†	†
Public and protective services	†	†	†	†	†	†	†	†
Trade and industry	3.20	5.71	2.06	10.32	3.30	5.39	2.36	5.49
Technology and communications	10.01	9.44	1.91	†	3.84	†	9.26	11.22
Personal and other services	20.38	†	8.84	†	17.50	†	1.49	†
Food service and hospitality	†	†	†	†	†	†	†	†
Child care and education	†	†	†	†	†	†	†	†

† Not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/92), "Second Follow-up, High School Transcript Survey, 1992" and National Education Longitudinal Study of 1988 (NELS:88/2000), "Fourth Follow-up, Postsecondary Education Transcript Survey, 2000."

Table D15. Standard errors for table 15: Percentage distribution of postsecondary attainment and enrollment status among 1992 12th-grade students who were career and technical education (CTE) concentrators and had enrolled in postsecondary education between 1992 and 2000, by number of undergraduate credits earned in a related career field

Undergraduate credits earned in a related career field	Highest degree earned as of 2000				No degree						
						Credits earned				Enrollment in 2000	
	Total	Certificate	Associate's	Bachelor's or higher	Total	0–10	11–29	30–59	60 or more	Enrolled	Not enrolled
Total	2.10	0.98	2.14	1.70	2.10	1.87	1.77	1.53	1.44	1.20	2.28
None	3.45	0.97	3.17	2.47	3.45	2.84	3.03	2.34	1.92	2.02	4.06
Any credits	2.57	1.57	2.65	2.35	2.57	2.57	1.87	2.09	1.72	1.15	2.76
1–3	6.42	1.64	3.91	6.07	6.42	7.54	2.41	4.43	5.41	2.97	7.61
4–6	10.60	1.94	4.35	8.84	10.60	14.54	4.86	2.70	2.13	1.93	11.08
7–9	8.48	2.88	3.07	8.74	8.48	3.54	8.88	3.56	4.92	4.45	8.54
10–12	8.22	7.80	4.10	2.56	8.22	9.51	11.94	5.37	3.68	3.84	9.01
13 or more	3.84	2.67	4.65	4.10	3.84	0.18	1.90	3.24	1.51	2.09	3.70

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Education Longitudinal Study of 1988 (NELS:88/92), "Second Follow-up, High School Transcript Survey, 1992" and National Education Longitudinal Study of 1988 (NELS:88/2000), "Fourth Follow-up, Postsecondary Education Transcript Survey, 2000."