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Undergraduate Enrollments in Academic, Career, and Vocational Education

This Issue Brief examines postsecondary vocational education within the context of all undergraduate education. The National Center for Education Statistics (NCES) has traditionally reported data on postsecondary vocational education using a taxonomy that divides subbaccalaureate postsecondary education into academic and vocational areas of study (Choy and Horn 1992; Levesque et al. 2000). To better reflect the correspondence between instructional fields and the educational requirements of careers in today's economy, NCES recently developed the new taxonomy described in this Issue Brief.¹ The new taxonomy classifies all undergraduate majors as academic majors or career majors. Because federal law defines vocational education as instruction for careers below the baccalaureate level,² the new taxonomy further divides career majors into subbaccalaureate and baccalaureate level majors. At the baccalaureate level, career majors are considered nonvocational and at the subbaccalaureate level they are considered vocational (see table 1). These majors are defined as follows:

Academic majors—Formal programs of study designed to impart knowledge and skills that represent the accumulated knowledge base in a subject area. The instruction is typically designed to be comprehensive, theoretical, and decontextualized (from a labor market perspective). For example, a mathematics major typically provides instruction across a broad range of mathematical content areas, including in-depth study of historical and theoretical perspectives, with minimal regard to specific occupational applications.

Career majors—Formal programs of study designed to impart knowledge and skills that represent the relevant accumulated knowledge within the context of occupation-specific job requirements. The knowledge and skills imparted typically involve less theory, more application, and a narrower focus than what is taught in an academic major; they are also often explicitly linked to occupational skill demands. For example, an engineering major (or engineering technology major) focuses on the mathematical principles and applications that are required for practice as an engineer (or engineering technologist), with more limited attention to areas of mathematics that do not have engineering applications. Career majors can be either vocational or nonvocational:

Vocational career majors—A subset of career majors consisting of formal programs of study that impart the knowledge and skills required for semiskilled, skilled, technical, and paraprofessional occupations that typically re-

quire education below the baccalaureate level (such as engineering technology).

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

Table 1. Percentage distribution of degree-seeking undergraduates, baccalaureate students, and subbaccalaureate students, by educational orientation: 1999–2000

Educational orientation	All degree-seeking undergraduates	Baccalaureate students	Subbaccalaureate students
Total	100.0	100.0	100.0
Academic	26.3	32.9	20.4
Career	66.2	60.7	71.2
Vocational career	37.6	†	71.2
Nonvocational career	28.6	60.7	†
No major declared	7.5	6.5	8.4

†Not applicable. Federal legislation defines vocational education as career education at the subbaccalaureate level.

NOTE: Detail may not sum to totals because of rounding. Standard errors for this table are available at <http://nces.ed.gov/pubsearch/pubinfo.asp?pubid=2004018>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1999–2000 National Postsecondary Student Aid Study (NPSAS:2000).

Other NCES publications (e.g., Snyder 2002) list the distribution of students by specific major. For this Issue Brief, specific majors were aggregated into the 19 broad areas of study listed in table 2; these areas of study include 7 academic and 12 career areas of study. (A 20th category includes students with no declared major.) These classifications are used here to describe (1) the distribution of undergraduates across academic and career education, including vocational and nonvocational career education (referred to here as *educational orientation*); and (2) the distribution of baccalaureate and subbaccalaureate students among the broad *areas of study* within these educational orientations. The analysis uses data from a national sample of students enrolled in postsecondary education, collected through the NCES 1999–2000 National Postsecondary Student Aid Study (NPSAS:2000).³ The analysis includes only NPSAS:2000 undergraduates who are seeking a postsecondary credential, referred to here as degree-seeking students.⁴

Table 2. Percentage distribution of degree-seeking baccalaureate students and subbaccalaureate students, by area of study: 1999–2000

Area of study	Subbaccalaureate students with:			
	Baccalaureate students	Sub-baccalaureate students	Academic majors	Vocational career majors
Total	100.0	100.0	100.0	100.0
Academic area of study				
English/literature and humanities	5.0	1.8	8.6	†
Fine and performing arts	3.7	2.2	10.9	†
Interdisciplinary studies	1.2	1.4	6.7	†
Liberal arts/general studies	2.2	9.8	48.1	†
Mathematics	0.9	0.6	2.8	†
Science	7.0	1.8	8.9	†
Social sciences	12.9	2.9	14.1	†
Career area of study				
Agriculture/natural resources	1.1	0.6	†	0.8
Business/marketing	18.9	15.5	†	21.7
Communications/design	6.9	5.8	†	8.2
Computer science	5.4	10.4	†	14.6
Education	8.4	6.0	†	8.4
Engineering/architectural sciences	6.3	3.8	†	5.3
Health care	8.0	14.4	†	20.3
Legal services	0.7	1.6	†	2.3
Personal and consumer services	1.1	3.1	†	4.3
Protective services	1.5	2.9	†	4.1
Public, social, and human services	1.8	1.5	†	2.1
Trade and industry	0.7	5.7	†	8.1
No major declared	6.5	8.4	†	†

†Not applicable.

NOTE: Detail may not sum to totals because of rounding. Standard errors for this table are available at <http://nces.ed.gov/pubsearch/pubinfo.asp?pubid=2004018>.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1999–2000 National Postsecondary Student Aid Study (NPSAS:2000).

Educational Orientation

Table 1 shows that, based on the new taxonomy, most degree-seeking undergraduate education is career related. Overall, about two-thirds of degree-seeking undergraduates were majoring in a career field in 1999–2000, and over one-third were majoring in a vocational career field. In comparison, approximately one-quarter of degree-seeking undergraduates were majoring in an academic field.

Although career education predominates at both the baccalaureate and subbaccalaureate levels, it is more common at the subbaccalaureate level, where 71 percent of students (compared to 61 percent of baccalaureate students) had career majors. Conversely, academic education is more common at the baccalaureate than at the subbaccalaureate level (33 vs. 20 percent, respectively). Nonetheless, about 1 in 5 subbaccalaureate students majored in academic fields, most often in liberal arts/general studies (table 2).

Areas of Study Among Subbaccalaureate Versus Baccalaureate Students

Although academic education is more common at the baccalaureate than at the subbaccalaureate level, only five of the seven academic areas of study—English/literature and humanities, fine and performing arts, mathematics, science, and social sciences—were majored in by a higher proportion of baccalaureate than subbaccalaureate students in 1999–2000 (table 2). No measurable difference was detected in the proportions of subbaccalaureate and baccalaureate students majoring in interdisciplinary studies. In contrast, the proportion of subbaccalaureate students majoring in liberal arts/general studies was about four times larger than the proportion of baccalaureate students majoring in this area of study.⁵

Again, although career education is more common at the subbaccalaureate than at the baccalaureate level, the results for specific areas of study within career education are more mixed. Six of the 12 career areas—computer science, health care, legal services, personal and consumer services, protective services, and trade and industry—were more commonly majored in by subbaccalaureate students. No measurable difference was detected in the proportions of subbaccalaureate and baccalaureate students majoring in public, social, and human services, and four career areas—business/marketing, communications/design, education, and engineering/architectural sciences—were more commonly majored in by baccalaureate than subbaccalaureate students.⁶

Subbaccalaureate Areas of Study

Fifty-three percent of all degree-seeking undergraduates in 1999–2000 were subbaccalaureate students (not in tables). While these students majored in a broad range of subject areas, four areas—the vocational career areas of business/marketing, computer science, and health care, and the academic area of liberal arts/general studies—accounted for about half of all subbaccalaureate majors (table 2). This pattern of enrollment reflects the dual role of community colleges (which serve most subbaccalaureate students) as providers of job training and as transfer institutions.⁷

Looking at academic and vocational students separately provides another perspective on subbaccalaureate enrollments. About half (48 percent) of all academic students at this level majored in liberal arts/general studies; no other area enrolled more than 14 percent of academic subbaccalaureate students. Among subbaccalaureate students with vocational career majors, 42 percent majored in the two fields of business/marketing and health care, and over half (57 percent) majored in the three fields of business/marketing, computer science, and health care.

Discussion

Using the new taxonomy, most baccalaureate and subbaccalaureate students are enrolled in career-oriented majors, as opposed to academic majors. Subbaccalaureate stu-

dents are more likely than baccalaureate students to enroll in career majors, with about 7 out of 10 subbaccalaureate students having vocational career majors. But these distinctions are far from clear-cut, since students tend to have a mix of educational goals; the NPSAS:2000 data show that no major fits exclusively into the academic, nonvocational career, or vocational career definition. For example, 12 percent of students majoring in liberal arts (an academic major in the taxonomy) at less-than-4-year institutions said their main reason for enrolling was to learn job skills; conversely, 12 percent of less-than-4-year marketing majors (a vocational career major in the taxonomy) reported that their main goal was to transfer to a 4-year institution (data not in tables). The taxonomy does reflect general differences in the focus of educational programs and the occupations for which programs prepare students; however, as the labor market and education systems continue to evolve, the classification system for postsecondary vocational education may need to be periodically revisited.

Footnotes

¹The revision process included the following steps: a review of community college course catalogs; a review of the taxonomy developed by the Center for the Study of Community Colleges' 1998 Curriculum Project (Schuyler 1999); an analysis of data on students' majors and degree expectations using the 1999–2000 National Postsecondary Student Aid Study (NPSAS:2000); an analysis of student postsecondary completions data using the NCES 1999–2000 Integrated Postsecondary Education Data System (IPEDS); an examination of data from the Bureau of Labor Statistics on the educational attainment of workers in over 800 occupational fields; and a one-day expert panel meeting of postsecondary faculty, administrators, and researchers. The new taxonomy classifies majors using the NCES Classification of Instructional Programs (CIP) (see U.S. Department of Education 2002); the taxonomy is available from the authors upon request. The taxonomy used here is a slight variation of the new taxonomy, which separates English/literature from humanities and includes liberal arts/general studies as part of humanities.

²The 1998 Carl D. Perkins Vocational and Technical Education Act, Section 3(29).

³The NPSAS:2000 methodology report (Riccobono et al. 2002) provides detailed information on the design and administration of this survey.

⁴In NPSAS:2000, non-degree-seeking students comprise 7 percent of all undergraduates. The analysis reported here is based on a sample of 45,778 degree-seeking undergraduates, for a weighted degree-seeking undergraduate population of 14,754,953. Degree-seekers were defined using the variable DEGFIRST, which was based first

on students' self-report of the credential (degree or certificate) they were seeking at their current postsecondary institution, and, where this information was not available, on the institutions' records of students' degree program. Subbaccalaureate students include (among others) students enrolled at 4-year institutions who reported that they were seeking a degree below the baccalaureate level. Students' majors were defined using the variable MAJORS, which was based first on students' self-report of their current major; where this information was not available, institutions' records were used.

⁵Liberal arts/general studies is often taken at the subbaccalaureate level by students who intend to transfer to a 4-year program; for example, in NPSAS:2000, 20 percent of subbaccalaureate students with this major reported that their main goal was to transfer to a 4-year program, compared to 11 percent of subbaccalaureate students in other majors.

⁶For agriculture/natural resources, small sample sizes resulted in data that were too unreliable to analyze.

⁷In 1999–2000, public 2-year institutions (community colleges) enrolled 89 percent of all students in less-than-4-year degree-granting institutions, and produced 73 percent of associate degree recipients and about 54 percent of all subbaccalaureate degree and award recipients (Snyder 2002, p. 204).

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