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ABSTRACT

Higher education not only contributes to the development of the human resources and intellectual betterment of the nation but is also a major economic enterprise. This research brief reviews and highlights data on the size and growth of higher education and illustrates how higher education institutions are preparing the future labor force. It examines higher education as a major employer; its training of professional talent in terms of associate degrees, certificates and awards, bachelor's degrees, first professional degrees, and doctoral degrees; the return on investment in college in terms of earnings and unemployment; the role of higher education in retooling the workforce; and higher education as a producer of technological and scientific knowledge. Findings include: (1) from 1980 to 1990, overall enrollment in higher education increased 15 percent, with higher increases for enrollment of students age 25 and older; (2) college graduates experience a competitive advantage in the labor market, with higher earnings and less unemployment; (3) higher education employed 2.5 million people in 1989; and (4) the number of doctoral degrees awarded has been increasing annually, but most of the gains have been due to increases in non-U.S. citizens receiving doctorates. The research brief explores implications of these trends. Contains 3 data resources and 12 references. (JDD)

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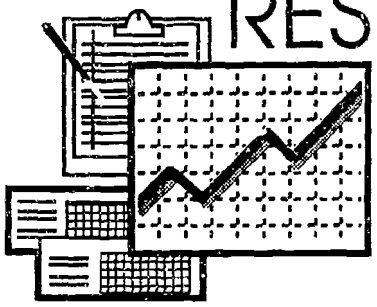

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The Higher Education Enterprise

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The Higher Education Enterprise

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Higher education not only contributes to the development of the human resources and intellectual betterment of the nation, but is also a major economic enterprise. This research brief reviews and highlights data on the size and growth of higher education and illustrates how higher education institutions are preparing the future labor force. These various indicators show the current status of higher education and its role in the U.S. economy.

FINDINGS AND IMPLICATIONS

- Contrary to the predicted decline in the number of traditional college-age students in the 1980s, enrollment in higher education increased from 12.1 million in 1980 to 13.9 million in 1990, mostly due to increased enrollment of older students and women.
- U.S. citizens are receiving a smaller share of doctorates as compared to non-U.S. citizens. Coupled with a projected shortage of academic faculty in some disciplines, this indicates that colleges and universities need to identify and encourage more students to pursue academic careers.
- College and university expenditures are holding steady. During academic years 1989 and 1990, higher education expenditures increased only 2 percent.
- College graduates experience a competitive advantage in the labor market. Compared to high school graduates they are less likely to be unemployed; they also enjoy higher median incomes. In 1989, male college graduates had a median income of $37,060 compared to $22,371 for their counterparts with a high school education.
- Higher education is a major employer; in 1989, 2.5 million people were employed in higher education.
- One of the major functions of higher education institutions is to train professional talent. In 1988-89, a total of 70,758 first professional degrees were awarded by colleges and universities, half of which were in law (35,567).
- In order for our nation to be competitive in an increasingly technological world we need to produce scientists and engineers; in 1984, 18,545 doctorates were awarded in the science and engineering fields and increased to 21,541 in 1989. However, most of the gains made in these fields were due to the increase of non-U.S. citizens receiving doctorates.

Higher Education is a Major Enterprise

- In 1969-70, there were 2,525 U.S. colleges and universities. Twenty years later, the U.S. had a total of 3,535 higher education institutions, constituting a growth of 40 percent, (NCES, March 1991)
- In 1989-90, 47 percent of higher education institutions were independent. Forty-four percent were public, and 9 percent were proprietary institutions.
- In 1989-90, 39 percent of higher education institutions were two-year colleges, another 60 percent were four-year institutions and 1 percent were less-than two-year institutions.
- During the last 20 years, from 1969-70 to 1989-90, the number of two-year institutions almost doubled. In 1969-70, there were 886 two-year institutions; in 1989-90, there were 1,385 two-year colleges
- Between 1969-70 and 1989-90, the number of four-year colleges and universities increased 30 percent, from 1,639 institutions to 2,127 colleges.

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- During the five year period 1985-86 to 1990-91, after adjusting for inflation, higher education expenditures increased 17 percent.
- Total 1990-91 expenditures by colleges and universities are expected to reach $155.4 billion; during the last year higher education expenditures held steady, with only a 2 percent increase in constant dollars.
- Voluntary support to higher education stood at $9.8 billion in 1990 (figure 1).
  - Between 1985 and 1990, adjusting for inflation using the Higher Education Price Index (HEPI), total voluntary support to colleges and universities increased 2 percent.
- In 1990, almost half of voluntary support funds (49 percent) were provided by alumni and other individuals.
- In 1990, 56 percent of voluntary support was for current operations and 44 percent was for capital purposes.

Higher Education is a Major Employer

- In 1989, 2.5 million people were employed by higher education institutions (Equal Employment Opportunity Commission, 1991).
- In 1989, higher education employed 789,869 faculty; 514,662 were employed full-time and 275,287 were employed part-time (EEOC, 1991).
- Between 1975 and 1989, the number of people employed by colleges and universities increased by 39 percent (from 1.8 million to 2.5 million). At the same time, enrollment grew by 28 percent.

Higher Education is Preparing Future Workers

Contrary to predicted declines in the 18-to-24-year old population in the 1980s, enrollment in higher education has increased steadily.

- In 1989, 38 percent of 18-to-24-year old high school graduates were enrolled in college, up from 33 percent five years earlier (Carter, 1991).
- During the decade 1980 to 1990, overall enrollment in higher education increased 15 percent (figure 2).
- In academic year 1990-91, an estimated 13.9 million students enrolled in higher education institutions; 12.1 million were undergraduate students and 1.8 million more were studying at the post baccalaureate level (table 1).

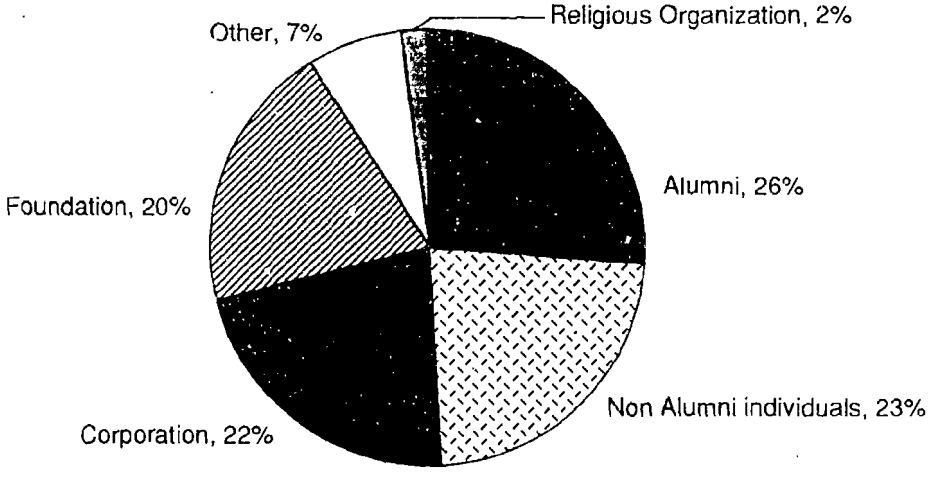
The rise in college enrollments in the 1980s was due in part to increased attendance among older students, women, some minority groups, and part-time students.

Although traditional college-age students (18-to-24-year olds) are the majority of college enrollees, their share of postsecondary enrollment has declined.

- In 1988, 61 percent of students enrolled were 18-to-24-year olds, compared to 67 percent in 1974 (figure 3).

Figure 1

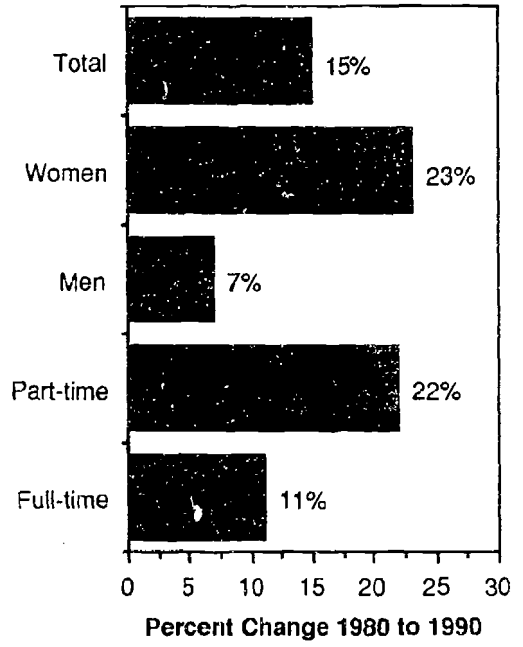
Voluntary Support of Higher Education by Source, Fiscal Year 1990. Total—$9.8 Billion



Source: Council for Aid to Education, *Voluntary Support of Education 1990: Volume 1—National Estimates and Survey Summary*, (New York: Council for Aid to Education, 1991), p.2.

Figure 2

Percent Change in Total College Enrollments, 1980 to 1990



Sources: National Center for Education Statistics, *Digest of Education Statistics, 1990.* (Washington, D.C.: National Center for Education Statistics, 1991), p.173.
National Center for Education Statistics, *National Higher Education Statistics: Fall 1990.* (Washington, D.C.: National Center for Education Statistics, 1991), Table 1.

Table 1

Enrollment in Higher Education, 1980 to 1990 (In thousands)

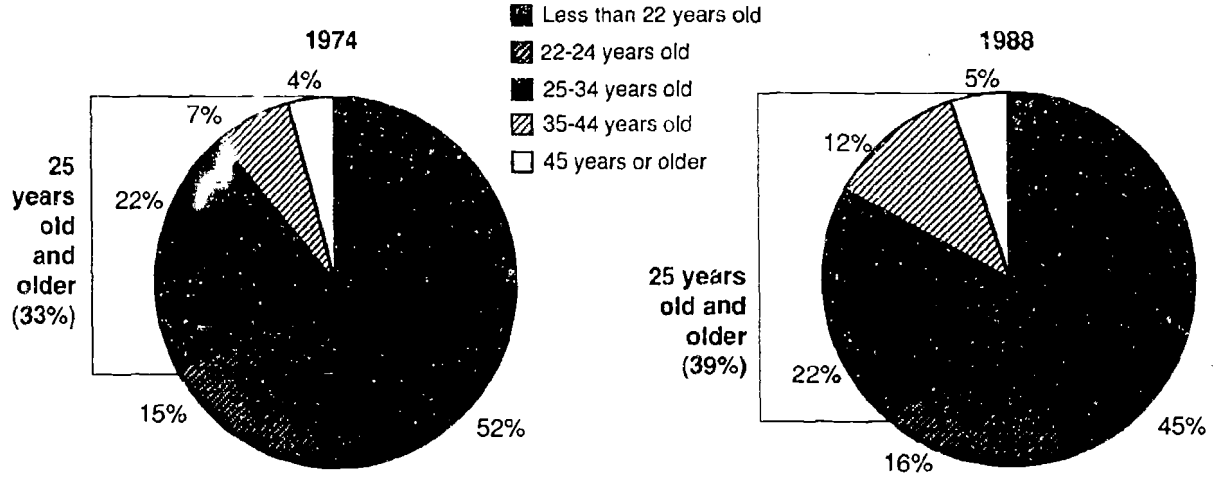
		Attendance Status		Sex	
Year	Total	Full-time	Part-time	Men	Women
1980	12,096	7,098	4,998	5,874	6,222
1981	12,371	7,181	5,190	5,975	6,396
1982	12,245	7,220	5,205	6,031	6,394
1983	12,464	7,261	5,203	6,023	6,441
1984	12,241	7,098	5,143	5,863	8,638
1985	12,247	7,075	5,171	5,818	6,429
1986	12,503	7,119	5,384	5,885	6,618
1987	12,766	7,231	5,535	5,932	6,834
1988	13,043	7,430	5,612	5,998	7,045
1989	13,490	7,708	5,782	6,146	7,344
1990[a]	13,951	7,932	6,019	6,324	7,626

a Estimated

Sources: National Center for Education Statistics, *Digest of Education Statistics, 1990.* (Washington, D.C.: National Center for Education Statistics, February 1991), p. 168;
National Center for Education Statistics, *Early Estimates, National Higher Education Statistics: Fall 1990* (Washington, D.C.: National Center for Education Statistics, December 1990). p. 6.

Figure 3

Percentage Distribution of Students by Age, 1974 and 1988



Source: U.S. Bureau of the Census, Current Population Reports, Series P-20, No. 286, School Enrollment, *October 1974* and unpublished tabulations for 1988.

Table 2
Associate Degrees Awarded
1979 to 1989

Year	Total (Number in thousands)
1979	402,702
1980	400,910
1981	416,377
1982	434,515
1983	456,441
1984	452,416
1985	454,712
1986	446,047
1987	437,137
1988	435,085
1989	435,210[a]

a Preliminary

Sources: Deborah J. Carter, *Community and Junior Colleges: A Recent Profile*. (Washington, D.C. American Council on Education, 1990.)

National Center for Education Statistics, unpublished data tabulations, 1991.

Table 3
First Professional Degrees, by Field

Professional Field	1978-79	1983-84	1988-89[a]
All Fields	***68,985***	***74,407***	***70,758***
Dentistry	5,488	5,353	4,247
Medicine	14,925	15,813	15,454
Pharmacy	639	709	1,074
Veterinary Medicine	1,714	2,269	2,157
Other Health Professions[b]	4,462	6,313	6,254
Law	35,387	37,012	35,567
Theology	6,370	6,878	6,005
Other	—	60	—

a Preliminary Data

b Includes optometry, osteopathy, podiatry, and chiropractic.

Sources: Charles J. Andersen, *1981-82 Fact Book for Academic Administrators*. (Washington, D.C.: American Council on Education), 1981, p. 163.

National Center for Education Statistics, *Digest of Education Statistics, 1990*. (Washington, D.C.: National Center for Education Statistics), unpublished data tabulations, 1991, p. 249.

- In contrast, between 1974 and 1988 the proportion of older students (25 years and older) increased from 33 percent to 39 percent.
- The number of older students enrolled in higher education increased from 3.2 million in 1974 to 5.1 million in 1988.
- Women have gained an increasing share of enrollments. In 1980, 6.2 million women were enrolled in college; by 1990, an estimated 7.6 million women were enrolled.
- The number of students enrolled part-time also increased during the decade, by 22 percent.
- College participation rates vary by race and ethnicity; however, the gap in college participation rates for African American, Hispanic, and white high school graduates was less between 1975 and 1977, when 18-to-24-year old high school graduates showed their highest college participation rate (Carter, 1991).
- Despite recent enrollment gains, Hispanics and African Americans made little progress in achieving parity with whites in college participation during the latter half of the 1980s. In 1989, for high-school graduates in the 18-to-24-year old group, 29 percent of Hispanics and 31 percent of African Americans were enrolled in college, compared to 39 percent of whites (Carter, 1991).

Higher Education Trains Professional Talent

Educating people for professional, managerial, administrative, technical and other occupations is one of the major functions of higher education institutions.

ASSOCIATE DEGREES

- In 1988-89, an estimated 435,210 associate degrees were awarded, representing an 8 percent increase over a decade ago (table 2).
- Over the last few years, however, the number of associate degrees awarded has held steady.

CERTIFICATES AND AWARDS

- In 1988-89, 104,233 certificates and awards were earned. Most of these awards are in the technical and occupational fields, such as communication technologies and business and management.

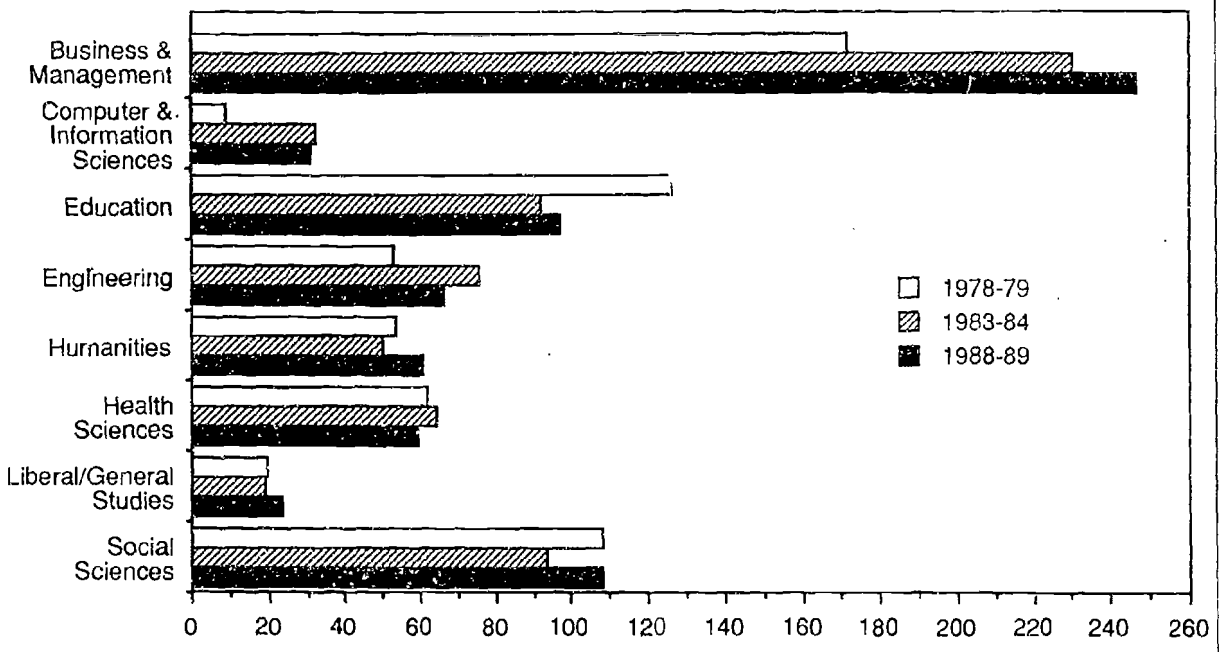
BACHELOR'S DEGREES

- In 1988-89, 1.0 million bachelor's degrees were awarded by colleges and universities; this represents a 10 percent increase over 1978-79 (figure 4).

In terms of bachelor's degrees, it appears that students are earning more degrees in the "career-related" fields.

Figure 4

Bachelor's Degrees by Discipline



Source: National Center for Education Statistics, *Digest of Education Statistics, 1990* (Washington, DC, NCES) 1991, p.224 and unpublished data tabulations

- In 1988-89, 238,699 bachelor's degrees were awarded in business and management, up from a decade ago, when only 171,764 degrees were awarded in this field.
- The number of students preparing to teach declined during that same decade. Between 1978-79 and 1988-89, the number of bachelor's degrees awarded in education was down by 23 percent.
- In 1988-89, 60,508 bachelor's degrees were awarded in the humanities, compared to 53,729 a decade earlier.
- Between 1978-79 and 1988-89, the number of bachelor's degrees awarded in liberal and general studies increased by 20 percent.

FIRST PROFESSIONAL DEGREES

Higher education prepares a cadre of physicians, lawyers, and other professionals.

- The number of degrees in the professions has been declining since 1984-85, when 75,063 first professional degrees were awarded. Between 1987-88 and 1988-89 the number of first professional degrees held steady.
- In 1988-89 a total of 70,758 first professional degrees were awarded by colleges and universities, half of which were in law (35,567) (table 3).
  - However, during the five year period 1983-84 to 1988-89, the number of law degrees awarded declined by 4 percent.
- Twenty-two percent of first professional degrees awarded were in medicine (15,454); the number of degrees in this field has basically held stable.

DOCTORAL DEGREES

Faculty are a crucial ingredient of our higher education institutions. Higher education now is at a point where it is necessary to maintain a steady supply of scholars for today and the future.

- In 1990, a total of 36,027 Ph.D.s were awarded in the U.S.; this represents a 16 percent increase over 1980.
- However, in terms of Ph.D. production, fewer Americans are receiving doctorates. Between 1980 and 1990, the number of Ph.D.s awarded annually to U.S. citizens decreased by 4 percent from 25,222 to 24,190, while the number of Ph.D.s awarded to non-U.S. citizens almost doubled from 4,934 to 9,398.
- During this same period, the share of all Ph.D.s earned by U.S. citizens decreased from 84 percent in 1980 to 72 percent in 1990. In comparison, non-U.S. citizens increased their share of doctorates earned from 16 percent to 28 percent.

- In 1990, the fields in which non-U.S. citizens received the greatest proportion of doctorates were engineering (57 percent) and physical sciences (40 percent).

Although more doctorates are being awarded, fewer Ph.D. recipients have commitments to enter academe. In 1990, a little over half (52 percent) had such commitments, compared to 64 percent in 1973, which was the peak year for doctorates earned.

- Ph.D. recipients in the humanities were the most likely to have employment commitments in academe (81 percent); those with doctorates in engineering were the least likely (27 percent).

The Return on Investment in College

EARNINGS

- In 1989, male college graduates (with four years of college or more) had a median income of $37,060 compared to $22,371 for males with only a high school education (Census 1991).
- Women college graduates also fared better than those with only a high school education. The 1989 median income for women with four years or more of college stood at $22,776 while those who were high school graduates had a median income of $11,945.
- Individuals without a college degree but with some postsecondary education still fare better than those without any. In 1989, males with 1 to 3 years of college had a median income of $26,697, greater than that of male high school graduates ($22,371).

UNEMPLOYMENT

- College graduates are less likely to be unemployed than those without a college education. In 1990, the total unemployment rate for adults (i.e., 25 to 64 year olds) stood at 5.5 percent. (Bureau of Labor Statistics, 1991).
- Adult college graduates (i.e., 4 years of college or more) had an unemployment rate of 2.4 percent, compared to 4.9 percent for high school graduates.

Higher Education Assists in Retooling the Workforce

The nature of the labor market is changing. Many of the occupations slated for growth between 1988 and 2000 will be in service-producing industries rather than in the goods-producing industries.

It is predicted that 18 million jobs will be added to the labor force between 1988 and 2000; 16.6 million of those jobs will be in the service-producing agencies (Silvestri and Lukasiewicz, 1989). Only 521,000 new jobs are projected in the goods-producing industries.

As the nature of the labor market evolves, many workers are faced with developing or gaining new skills and training in order to compete effectively in the labor market. Also, between 1988 and the year 2000, jobs in technical and related support are projected to grow 32 percent, more rapidly than any other occupational group (Ottinger, 1990). Many of these workers are trained at community/technical colleges and usually require at least one year of training beyond high school. Higher education has played a growing role in helping adults and others prepare for changes in the labor market.

A report by the National Association of College and University Business Officers (NACUBO) found that more and more individuals are developing career "portfolios" in which they have several careers with different organizations throughout their working years. This further indicates that adults attend higher education institutions to meet new educational goals. Adults also enter college to upgrade their skills if they feel they are underemployed, if they are faced with unemployment or if they are reentering the workforce.

- Enrollment of older students increased considerably in the 1980s. The number of adults 25 years and older attending higher education institutions increased by 59 percent between 1974 and 1988.

Because many adults have demands on their time due to their jobs and families, most attend college on a part-time basis.

- In 1990, 6.0 million students attended college on a part-time basis, up from 5.2 million 10 years earlier.

Higher Education is a Producer of Technological and Scientific Knowledge

Key to the U.S. role in the global economy is the production of scientific and technological knowledge. Higher education institutions not only educate future scientists and technicians, they also conduct and produce research and knowledge in scientific fields.

Over the last 10 years, federal allocations to higher education institutions for research and development in academic science/engineering have increased.

- In fiscal year (FY) 1989, federal funding to colleges and universities for academic science and engineering is estimated to have been $8.5 billion; this represents a 10 percent increase over the previous year (NSF, June 1991).

Fewer students are earning baccalaureate degrees in science/engineering fields.

- In 1989, 307,580 bachelor's degrees were awarded in science and engineering, down from 314,666 in 1984 (NSF, 1991).
- Between 1985 and 1989, the number of bachelor's degrees earned in engineering dropped by 12 percent, from 76,531 to 67,214.

However, the number of degrees awarded in science and engineering at the advanced level has increased.

- In 1989, a total of 66,026 master's degrees were awarded in the sciences and engineering, up from 59,569 five years earlier.
- At the doctoral level, the number of Ph.D.s awarded in the sciences was up by 16 percent from 18,545 in 1984 to 21,541 in 1989. However, a larger proportion of science and engineering doctorates are awarded to non-U.S. citizens. For example, in 1989 more than half of the 4,536 doctorates awarded in engineering were to non-U.S. citizens (55 percent).

SUMMARY AND IMPLICATIONS

Higher education is a strong contributor to the national economy, colleges and universities provide employment in their communities, provide leadership in developing technological advances, prepares individuals for their careers and responds to individual's needs, due to the changing nature of the labor market. The role of higher education in America's role in the global economy is clear. Yet there are some challenges which lie ahead for the higher education enterprise.

New and particular demands for higher education are expected to increase due to the projected changes in the labor market. Jobs experiencing the most growth in the 1990s will require much higher skill levels, and some higher education will be key to achieving success in the labor market. The role of higher education in developing America's human resources is evident.

Community colleges have played a leading role in responding to the needs of adult students, women and minorities, as well as to the changing demands of the labor market. However, in the coming decade all institutions will have to pay attention to trends in the labor market and the needs of adults and minorities. This will require more flexibility in the scheduling of courses and selecting their locations, and more opportunities for students to complete their work on a part-time basis. Colleges and universities also will need to interact more with businesses and industry to plan degree programs and design courses to meet their needs.

Higher education administrators thus confront several questions due to these trends:

- Will higher education institutions be able to maintain enrollments as the population changes? How can colleges and universities best serve the educational demands of older age groups?
- What mechanisms can be used to increase the college participation of Hispanics and African Americans?
- Will the urgency of reducing the nation's federal deficit limit funding for new federal programs and/or affect the funding of current education programs?
- What impact will the trends toward a smaller number of Americans earning Ph.D.'s have on the supply of future faculty, particularly in the sciences?
- What strategies can institutions develop to encourage more students into the sciences and engineering?

RESOURCES

1. The National Center for Education Statistics (NCES) annually publishes a compendium of education statistics; the most recent publication is the *Digest of Education Statistics, 1990*. This publication provides data on higher education trends including: higher education expenditures; enrollment by age, sex and race; number of institutions; degrees awarded; and data collected by NCES through its various surveys. For further information contact the Government Printing Office at (202) 783-3238.
2. The Census Bureau provides data on the median family income by race, ethnicity, level of education and family type, and on the share of aggregate income via its March *Current Population Reports*. The data are reported annually in the *Money Income and Poverty Status in the United States*, Series P-60. For further information call (301) 763-8576.
3. There are several recent publications which look at higher education and its impact on the economy. These include: Katharine H. Hanson and Joel Meyerson, editors. *Higher Education In A Changing Economy*. (New York: American Council on Education & Macmillan Publishing Company, 1990); K. Scott Hughes, Carol Frances and Barbara J. Lombardo. *Years of Challenges: The Impact of Demographic and Workforce Trends on Higher Education in the Economy in the 1990s*. (Washington, D.C.: National Association of College and University Business Officers, 1991).

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