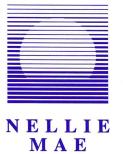




I ike the young boy pictured here, many children are getting the support they need to be successful in school through programs that address specific needs like tutoring, mentoring, career awareness, child care, and more.

At Nellie Mae, we're committed to helping students all over New England get the support they need to pursue a higher education. Through the Nellie Mae Fund for Education we provide grant assistance to school/college partnerships that increase college awareness, provide academic support, and establish a positive environment in which students can grow.

For more information about the partnership programs supported by the Nellie Mae Fund for Education, please contact Sylvia Salas, Director, at 1-800-EDU-LOAN.



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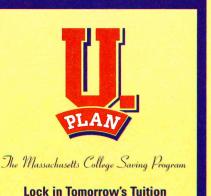
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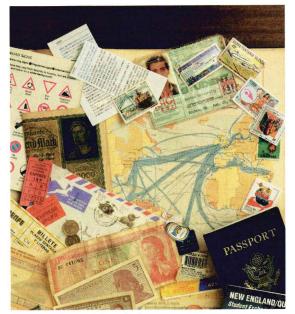
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Cover by Marc Teatum and John O. Harney.

COMMENTARY

32 Excerpts

Lawrence E. Gladieux on College Opportunities and the Poor Connecticut Department of Higher Education on Student Financial Need

William A. McEachern on the Light at the End of the Cable The Education Resources Institute and Institute for Higher Education Policy on Life after 40

- **36** Public Colleges and Universities Vie for New England's Elusive Philanthropic Dollar *John C. Schneider*
- **41** William M. Bulger on the University of Massachusetts and Economic Development

Observations from the Senate President-turned-University President

- **43** New England's School-Age Population: Listening for an Echo
- **45** Nobel Laureate Mario J. Molina on Enjoying Science Inspiration from the Mexican-born Winner of the 1995 Nobel Prize in Chemistry
- **47** Copyrights and the Virtual Classroom *John O. Harney*

COVER STORIES

- **12** A Global Connection: Foreign Enrollment, International Education and World Trade John C. Hoy
- **16** The Global Economy: Where Does New England Fit In? *Richard J. DeKaser*
- **19** Exports: The World Buys New England Products *Data reveal the region's international trade position*
- **22** These School Ties Bind Continents *Stephen P. Tocco*
- **24** International Education for a Multipolar World Claire L. Gaudiani
- **27** Foreign Enrollment: Beating a Path Data reveal preferences of foreign students
- **30** Community College of the World Carole A. Cowan and Frank M. Falcetta

CONNECTION'S Directory of International Resources

A listing of New England and national organizations involved in international trade and international education. Pages: 14,15,17,18,23,25,26,31

DEPARTMENTS

- 5 Editor's Memo *John O. Harney*
- 6 Short Courses
- **10** Data Connection
- **50** Campus: News Briefly Noted



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The New England Board of Higher Education is a nonprofit, congressionally authorized, interstate agency whose mission is to foster cooperation and the efficient use of resources among New England's approximately 260 colleges and universities. NEBHE was established by the New England Higher Education Compact, a 1955 agreement among the states of Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island and Vermont.

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E D I T O R 'S M E M O

Connection has devoted a fair amount of ink during its 11 years of publication to two subjects that may at first seem scarcely related: New England's economic competitiveness in world markets and the region's magnetic appeal to foreign students. This issue looks at both, along with international programs for New England students, as part of a single, larger phenomenon: the globalization of New England's knowledge-intensive economy.

What is the relationship between New England's attractiveness to foreign students and the region's international economic position, particularly, its export trade?

For starters, when a foreign student pays tuition and fees at one of the region's colleges or universities — and last year, nearly 39,000 did — a New England service is being exported. But foreign enrollment also has a broader, less quantifiable effect on trade. Indeed, with a few notable exceptions, the nations whose students travel to New England in the largest numbers — and make contacts here — are the same ones with which New England conducts most of its trade.

Moreover, the scientific talent upon which much of New England's export-dependent economy is based has a distinctly international flavor. Nearly one in four U.S. scientists and engineers with doctorates is foreign-born. Massachusetts Institute of Technology faculty who have won Nobel prizes hail from Japan, India, Italy and Mexico. And many of the central characters in the story of New England's modern economy have been foreign-born, high-tech entrepreneurs.

Our linking of foreign enrollment, international education and world trade, however, begs for some qualifications. Most importantly, the need for international awareness is too often presented solely as an imperative of economic competitiveness. It's true that we need to understand other cultures in order to sell them things. It's a borderless world, and many New England jobs depend on exports. But as Connecticut College President Claire L. Gaudiani notes, "In the multipolar world, international education must be reconceived not only to ensure New England's prosperity, but also to achieve global stability and improve the lives of the poor."

As trade becomes freer, child labor and other human rights abuses become New England's business — literally. The data provide few clues about the working conditions condoned or encouraged by some of our new trading partners nor about the extent to which New England-taught American business practices are applied to Asian or Latin American sweatshops. No wonder an Amherst, Mass., nonprofit organization called Verité and similar groups have found a niche helping U.S. companies ensure that their overseas suppliers meet human rights and fair labor standards.

In addition, more than ever before, international education has applications here at home. Sixty or more languages are spoken in the Providence, R.I., schools, and ethnic minorities will account for large proportions of new workforce entrants. Exposure to foreign cultures can play a vital role in improving intercultural relations here in New England and is a prerequisite for success even in the domestic economy.

Finally, the internationalization of New England's higher education and economy, though it has been talked about for many years, is not a done deal. Talk of restrictions on immigration, opposition to U.S. involvement in relief efforts in Africa and an array of "America First" feelings argue otherwise. The economic *and* humanist rationales for international education should be continually advanced to keep international awareness on the front burner.

* * * * *

INECTION'S Spring/Si

We are pleased to note that CONNECTION'S Spring/Summer 1992 issue on regional-ism remains timely. In September, the New England Board of Higher Education granted permission to Temple University to reprint the issue's "Cover Stories" on regionalism and interstate cooperation in their entirety in an edited volume entitled, *American Confederal Experiences, Past and Present*, to be copublished by Temple's Center for the Study of Federalism and the University Press of America.

John O. Harney is the editor of Connection.

Schools of Fish

New England produced nearly \$127 million in farm-raised shellfish and finfish in 1995, up 11 percent from \$114 million in 1992, according to new data released by the Northeastern Regional Aquaculture Center at the University of Massachusetts at Dartmouth.

Connecticut led the region with a farm gate

value over \$61 million, much of it accounted for by oysters. Maine was second at \$55 million, thanks largely to salmon.

Policymakers have targeted aquaculture as a potentially vital New England industry, partly because decades of overfishing Georges Bank and other fertile areas, followed more recently by government measures to protect groundfish, have wracked

New England's traditional fishing industry, and partly because the fate of fish farming is tied to scientific research and skilled workers — as abundant in this region as the cod once was.

A Tufts professor is mapping the shrimp genome as a first step toward farming the larger shrimp favored by Americans, while a University of Connecticut biotechnology researcher has developed a way to grow larger tilapia.

A Massachusetts Institute of Technology engineer is working with the city of Boston on a plan to raise lobsters, bluefin tuna and summer flounder on nearby Moon Island while conducting aquaculture research at the site. UMass-Dartmouth officials are exploring the possibility of developing an aquaculture incubator in nearby New Bedford. And the University of Rhode Island is building a \$2 million aquaculture laboratory at its Narragansett Bay campus with support from the U.S. Department of Agriculture.

Specialized skills are crucial to aquaculture's success. Since 1993, the Bridgeport Regional Vocational Aquaculture School, a public high school in Bridgeport, Conn., has offered area students a special marine-related curriculum complete with aquaculture labs and a 56-foot research vessel. In 1994, the New Haven Sound School was designated as the second Connecticut center for aquaculture; two more centers are planned.

As part of its New England Technical Education Partnership, the New England Board of Higher Education has begun forming a New England Aquaculture Network to encourage smooth transfer of credits among middle schools, high schools and college-level aquaculture programs and to provide faculty development programs. One transfer articulation program is already being developed among the New Haven Sound School, Gateway Community-Technical College and UConn.

Real Progress?

One problem with the Gross Domestic Product (GDP) is that it measures all economic activities — even costs associated with social and environmental breakdown — as economic gains, while ignoring the value of non-monetary activities. For example, most pollution adds to the GDP twice: when the polluting takes place and when it's cleaned up. Volunteer work shows up not at all.

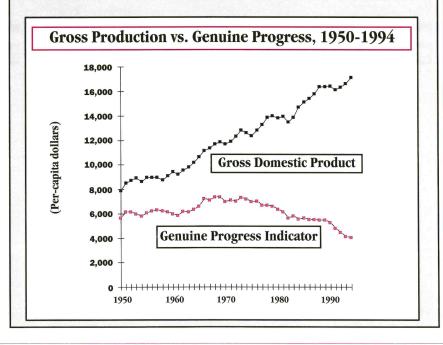
With support from the Rockefeller Brothers Fund, a San Francisco-based group of economists, policy analysts and others called Redefining Progress has developed a prototype alternative index of economic progress.

The Genuine Progress Indicator (GPI) takes into account two dozen social and environmental factors ignored by the GDP. For example, the GPI reflects the economic contribution of housework by multiplying the number of hours of housework performed by the amount a family would have to pay to hire outside help. And while expenses associated with divorce, crime and other social breakdowns push up the GDP, such costs are substracted from the GPI.

The bad news: While the GDP has been growing fairly steadily since 1950, the GPI has been declining since the 1970s, and plunging since 1990.

The GPI is not intended to replace the GDP, but to advance cost accounting, according to Ted Halstead, executive director of Redefining Progress. "The problem is political leaders and media tend to use the GDP as a synonym for the health of the economy, even though it was intended to measure total economic production," says Halstead. "The GDP doesn't value social capital."

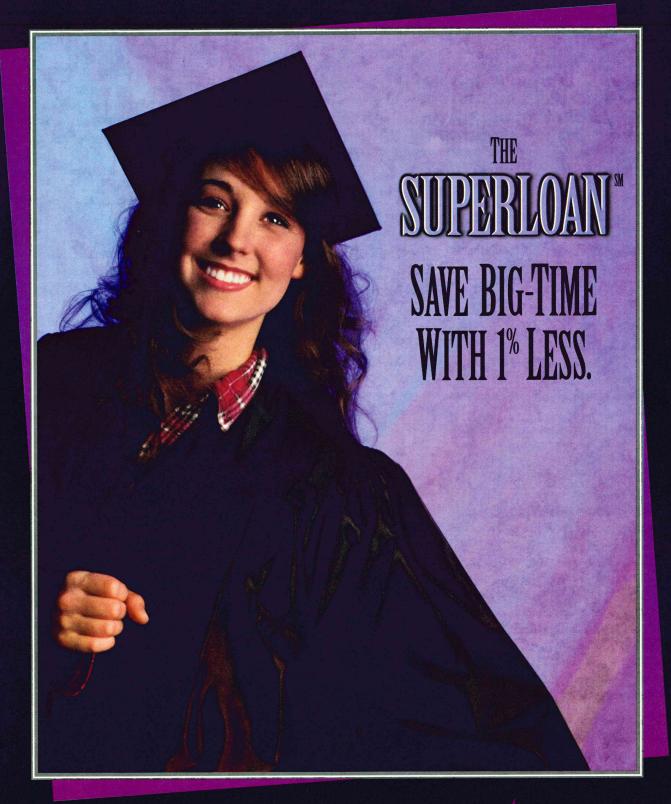
Ironically, one item upon which the California group could not reach consensus was the cost-benefit of education — it's not included in the GPI.



Networking: Boost from the GE Fund

The New England Board of Higher Education was awarded a three-year, \$180,820 grant from the GE Fund to expand its five-year-old Science and Engineering Academic Support Network.

The network aims to increase the number of underrepresented minority students who



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pursue science, engineering or math programs at New England's predominantly White campuses and go on to work in those fields.

Since 1992, the network has brought together nearly 1,800 minority students from high school through graduate school with scientists and engineers from academia and industry who serve as mentors to the students.

University of Connecticut electrical engineering Professor Eric Donkor, a network mentor, observed that the program "generates confidence-building, provides peer encouragement and support and helps underrepresented students obtain professional advice and guidance."

High Standards

The Massachusetts Board of Higher Education is studying a proposal to establish an elite state college with higher academic standards than other public higher education institutions.

Some board members worry that such a college would drain scarce resources from other institutions and skim off the best students. But high standards are in vogue all over New England.

Consider Franklin Pierce College's recent suspension of dozens of students who could not maintain "D-plus" averages.

As the *Washington Post* editorialized, "The cropping up here and there of policies that emphasize performance is a shift away from the obsession with warm bodies, under which private schools with high tuition — especially those without a big reputation or vaunted selective admissions policy — focused on parking fee-paying students in seats."

Genius Schools

The Chicago-based John D. and Catherine T. MacArthur Foundation, best known for its "genius grants" to creative individuals, has recognized three New England colleges for their innovative approaches to education.

Hampshire College, Marlboro College and the College of the Atlantic are among just six liberal arts schools nationally to be awarded three-year, \$750,000 grants from the Foundation, which is headed by former Hampshire President Adele Simmons.

The three colleges have been piling up kudos from other sources as well.

In the spring, Hampshire and Marlboro, along with Clark University, were counted among *Colleges that Change Lives: 40 Schools You Should Know About Even if You're Not a Straight-A Student*, a book by former *New York Times* education editor and university administrator Loren Pope (See Connection, Summer 1996).

A recent Princeton Review report, meanwhile, ranked College of the Atlantic No. 1 in the nation in quality of life.

50 and Counting

Where will you find the world's only academic department devoted to the history of mathematics?

In Providence. Brown University's math history department, which turns 50 in 1997, enjoyed its heyday in the 1970s, when four professors were unlocking the mysteries of ancient math.

Now, the smallest academic department at Brown consists only of 73-year-old Professor David Pingree, his former student and now visiting lecturer Kim Plofker, and three graduate students. The department doesn't offer an undergraduate concentration.

Pingree, a former MacArthur fellow, has devoted his life's work to studying the transmission of exact sciences, math, astronomy and astrology from ancient cultures through Renaissance Europe.

Plugged In

More than 200 Massachusetts nonprofits, including dozens of colleges and universities, are considering joining forces to get the best deals in the Bay State's soon-to-be-deregulated electric power market.

The Massachusetts Health and Educational Facilities Authority, an independent state agency, has invited nonprofit organizations including colleges, hospitals and museums to pool their purchasing power through PowerOptions: The Massachusetts Nonprofit Energy Purchasers Cooperative.

Starting in January 1998, Massachusetts utility customers will be able to buy electricity from virtually any supplier in North America. Large groups of customers are expected to save money under the deregulation.

Comings and Goings

Philip E. Austin, former chancellor of the University of Alabama System, became president of the University of Connecticut. ... Daniel S. Cheever Jr., former president of Wheelock College and the American Student Assistance Corp., was appointed president of Simmons College after serving for one year as interim president.

Ira Rubenzahl, former vice president for academic affairs and student support at Greenfield Community College, became president of Capital Community-Technical College. ... Diana Van Der Ploeg, former associate vice president of Aims Community College in Colorado, was appointed president of Gateway Community-Technical College. ... Janis Wertz, former vice president for planning at the Culinary Institute of America in New York, was named president of Housatonic Community-Technical College.

William Dill, former president of Babson College and more recently interim president of Anna Maria College, was named interim president of the Boston Architectural Center. ... William H. Lopes, former senior vice president for academic affairs at Westfield State College, was named acting president of the college. ... Mary A. Huegel, former associate dean of the Lesley College School of Education, became president of Aquinas College at Milton, which announced it would merge with Aquinas College at Newton within two years.

University of Maine President Frederick Hutchinson announced he would leave his post in the summer of 1997. ... Ronald P. Renaud retired after 13 years as president of Washington County Technical College.

Robert S. Karam, a Fall River business leader and radio station owner, was elected chair of the five-campus University of Massachusetts Board of Trustees. ... Frederick G. P. Thorne, chair of Harbor Capital Management Co. of Boston, was elected chair of the Bowdoin College trustees. ... Elizabeth Shorr, senior vice president of corporate affairs at Blue Cross and Blue Shield of Maine, was elected chair of the Maine Technical College System trustees.

Ronald C. Baird, former vice president of university relations at Worcester Polytechnic Institute, was named director of the National Sea Grant College Program.

The surprising facts about the cost of student loans.*

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Percentage of high school graduates from high-income families who go directly to college: 77%

Percentage of high school graduates from middle-income families who do: 58%

Percentage from low-income families who do: 45%

Percentage of U.S. high school graduates educated at private high schools: 10%

Percentage of Connecticut high school graduates educated at private high schools: 19%

Percentage of Yale University freshmen educated at private high schools: 37%

Percentage of U.S. students who graduate from high school having taken algebra, geometry, trigonometry, precalculus, biology, chemistry and physics: 10%

Percentage of U.S. adults who know what a molecule is: 9%

Respective national ranks of the University of Massachusetts at Lowell and Harvard University in number of master's degrees granted in chemistry: 2,3

Increase in asthma-related hospitalization of children and adolescents in Massachusetts, 1990 to 1993: 14%

Change in number of physical fights between students in Long Beach, Calif., since a mandatory school uniform policy and various conflict resolution strategies were adopted last year: -51%

Percentage of University of Connecticut alumni who live in New England: 73%

Percentage of 1994 Framingham State College graduates who work in New England: 93%

Number of Framingham State College alumni who are presidents of New England colleges: 2

Chance that a University of Massachusetts president has been a New Englander: 1 in 3

New England-based firms among America's 100 best companies for working mothers in terms of pay, advancement, child care, flexibility and family friendly benefits: 14

New England-based firms among America's 100 fastest-growing companies in terms of revenues, net income and stock prices: 14

New England-based firms among Forbes 200 best small companies in terms of return on equity: 15

Number of Forbes 200 best small companies whose CEOs hold one or more degrees from a New England college: 15

Number of Forbes 200 best small companies that are headed by New England-educated CEOs and based in New England: 3

Approximate number of years it takes for a Dartmouth College or Massachusetts Institute of Technology MBA to pay for itself: 5

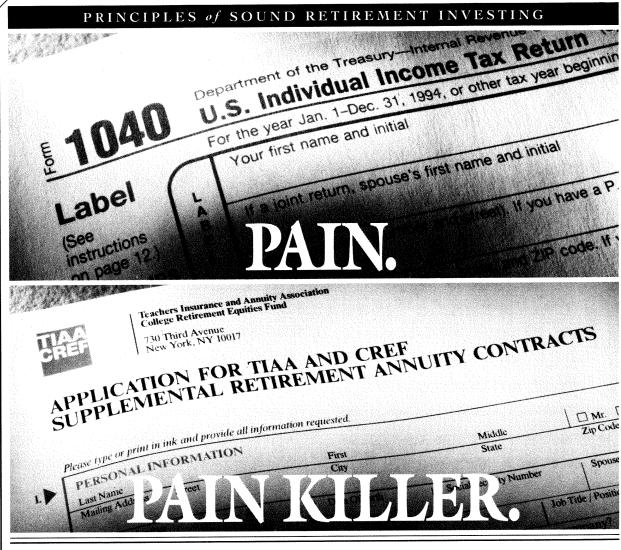
Average tenure of nursing home administrators in months: 18

Percentage of executives who say they would not hire a job candidate whose resume contains a typo: 45%

Number of cruise ships that visited Boston in 1986: 19

Estimated number that will do so in 1996: 51

Sources: 1,2,3 U.S. Department of Education; 4,5 Postsecondary Education Opportunity; 6 Yale University; 7 National Action Council for Minorities in Engineering; 8 National Science Foundation; 9 American Chemical Society (Northwestern University ranks No. 1); 10 Massachusetts Division of Energy Resources; 11 Education Commission of the States; 12 University of Connecticut; 13,14 Framingham State College (Paula M. Rooney is Dean College president; Paul J. LeBlanc is Marlboro College president.); 15 University of Massachusetts; 16 NEBHE analysis of Working Mother data; 17 NEBHE analysis of Fortune data; 18,19,20 NEBHE analysis of Forbes data; 21 Business Week; 22 Brown University Community Health-Gerontology Center; 23 OfficeTeam; 24,25 Massport



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New England and the World

A Global Connection: Foreign Enrollment, International Education and World Trade

John C. Hoy

he pace of globalization in New England is accelerating. The six-state region consistently ranks first or second among the nine regions of the country on three important measures of manufacturing export intensity: exports as a share of all manufactured goods; exporting businesses as a share of all businesses; and export-related manufacturing employment as a share of total manufacturing employment. Though data on service sector exports are scarce, the for-

eign business conducted by New England's considerable financial services, venture capital, management consulting, health and education industries further distinguishes the region. Meanwhile, growing numbers of overseas visitors travel to the region's cities, beaches and mountains for pleasure or business.

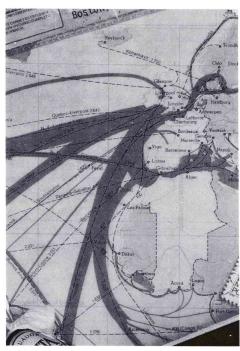
New England's vaunted higher education enterprise, long con-

sidered *world-class*, is also increasingly international in its practical operations and outlook.

A family from Qatar provides Harvard University with funds to build a major center for environmental policy. The University of Rhode Island's Coastal Resources Center helps design coastal management plans in Sri Lanka, while a University of New Hampshire program aims to improve nursing education in Russia. At the University of Connecticut, a management professor studying business relationships

in Brazil, Chile and Argentina is awarded a research grant by the European firm, Airbus Industrie, while a colleague in human development and family relations wins a Fulbright grant to study the elderly in Turkey.

And as they have for decades, thousands of foreign students and scholars converge on New England, making it the center of an increasingly complex and competitive world market for globetrotting students.



FOREIGN ENROLLMENT

The United States hosted 453,787 international students in academic year 1995-96 — more than any other country, according to new 1995-96 data from the New York City-based Institute of International Education (IIE). Nearly 39,000 of them — about 9 percent — studied in New England.

Facing a dwindling pool of traditional college-age New Englanders and relatively high costs, many of the region's public and independent colleges and universities have taken a strategic interest in foreign students, who commonly pay full tuition without tapping already-stretched campus financial aid funds.

More than three-quarters of foreign students in New England pay for their college education primarily with funds from outside the United States. Even at institutions where tuition doesn't cover the full cost of instruction, the tuition-paying international students effectively subsidize needy U.S. students.

Many New England colleges and universities have aggressively recruited foreign students with impressive results. Berklee College of Music, for example, works with seven international institutions to search the world for gifted foreign musicians, who account for four in 10 students at the Boston campus.

Boston University enrolled 4,532 foreign students last year — more than any other college in the United States. Harvard ranked ninth nationally, enrolling 3,137, and Northeastern University ranked 22nd, with 2,416. Indeed, foreign students account for one of every 31 college students nationally, but one of every 21 in New England and one of every 16 in Massachusetts.

Today, New England hosts 12 times as many foreign students as it did in the mid-1950s, when just over 3,000 foreign nationals enrolled at the region's campuses. In the past decade alone, foreign enrollment in New England has grown by 48 percent from just over 26,000 to 38,811, while foreign enrollment nationally has grown by 30 percent.

But worldwide competition for foreign students is intensifying. As a result, annual growth in foreign enrollment nationally has



flattened over the past six years to under 0.3 percent in 1995-96 — the lowest one-year gain since the 1970s, according to IIE. In New England, foreign enrollment grew by less than 0.2 percent last year.

For the second consecutive year, the total number of Asian students in the United States decreased, partly because of the emergence of world-class institutions closer to home. Growth in Western European students pursuing higher education in the United States is also flattening, reflecting the effectiveness of European Union programs such as Erasmus, which eases the mobility of students and scholars across national borders within Europe; Lingua, which encourages study of foreign European languages; and Comett, which links universities and industries. Additional programs foster intra-European exchange at the secondary level and in professional education.

Flat foreign student enrollment has significant consequences for New England's higher education enterprise and overall economy. Foreign students spend more than \$700 million annually in New England on college tuition, room and board and living expenses. They also provide one another and their American peers with vital cross-cultural exposure, aiding in higher education's search for cultural diversity and global relevance. In addition, nearly 60,000 foreign scholars — non-immigrant, non-student teachers — are conducting research at U.S. universities, fueling the knowledge economy.

A WELCOME MAT?

But if a country is to reap the economic and cultural advantages of foreign enrollment, it must maintain a hospitable climate for foreign students. Germany is learning this the hard way. The journal *Science* noted recently that international student interest in German universities is sinking, in part because the Bonn government gives stu-

dents weak immigration status, and universities are very restrictive about accepting foreign academic credits.

America's welcome mat has been frayed as well. Most recently, an odd coalition of underemployed U.S.-born scientists and cultural conservatives have backed legislative efforts to limit the number of foreign educators and researchers allowed in the United States each year, while restricting visa requirements for international students and scholars. And the United States has never fully supported foreign students with university-based programs along the lines of the Rhodes and Marshall scholarships that have sent Americans from every state through Oxford and Cambridge.

There are some bright spots, however. At Wesleyan University, for example, a program funded with a \$23 million commitment from the Freeman Foundation offers four-year scholarships to 20 students from 10 Pacific Rim countries to study at Wesleyan in the hope they will graduate and assume leadership positions in their native countries; 80 Freeman Asian Scholars are continuously enrolled at the Connecticut institution. And the Massachusetts Educational Financing Authority has developed special low-interest loan programs for students from Canada, Argentina and Brazil.

INTERNATIONAL AWARENESS

Foreign student enrollment should be a two-way street, but most of the traffic is headed *toward* the United States. Though nearly half a million foreign students studied in the United States in 1995-96, only 84,403 Americans studied abroad for credit — and only 14 percent of those remained abroad for more than one semester!

This trade imbalance is just one of several persistent concerns about the level of international curiosity, exposure and competence displayed by U.S. students.

U.S. colleges have been assailed for

Resources

Following is a partial listing of New England and national organizations involved in international trade and international education.

Alliance for International Educational and Cultural Exchange Washington, D.C.

Coalition of nonprofit education groups promotes international education policies and publishes guide to nonprofit educational exchange organizations and pertinent federal agencies.

Alliance for the Commonwealth Boston, Mass.

Nonprofit research and educational foundation established by Associated Industries of Massachusetts provides trade services to Bay State businesses and compiles Massachusetts Export Index to gauge strength of state export trade.

American Council on Education International Initiatives Office Washington, D.C.

Arm of nation's chief higher education lobbying group helps shape federal policies on international education and supports networks of college presidents and others interested in international issues on campus.

American Institute for Foreign Study Greenwich, Conn.

For-profit outfit arranges studyabroad programs for U.S. college students, including Au Pair in Europe program permitting U.S. students to study part-time in Europe while providing child care for host families. weak foreign language offerings, especially in important non-Western languages such as Arabic, Chinese, Japanese and Russian. The American Council on Education reports that U.S. colleges and universities confer 10 times as many degrees in German as in Chinese. And of the high school and college students who study a foreign language, about 97 percent choose French, German or Spanish, according to the National Council of Organizations of Less Commonly Taught Languages at Johns Hopkins University.

Educators in New England face a range of questions about the best ways to provide international knowledge for U.S. students. How does the college experience offer both international content and international "skills" such as how to hail a cab - or for that matter, how to negotiate a contract — in Singapore? Should international perspectives be integrated into all courses or centralized in a distinct, required "international" course? How can institutions ensure that faculty members are, themselves, internationally savvy? Which studyabroad and international internship programs should be offered? What campus programs could be used to strengthen cross-cultural connections?

To be sure, many New England campuses already offer an array of small, but sound, programs to improve students' international awareness and competence.

Among recent initiatives, UConn and five

other universities in the United States, Canada and Mexico recently agreed to a three-year academic exchange project, permitting UConn students to study and pursue internships in Canada or Mexico.

And some New England community colleges also offer programs that had traditionally been the province of four-year colleges: A Northern Essex Community College program gives students the opportunity to study at Bangalore University in India and more than 20 other foreign campuses. Middlesex Community College provides a three-week summer program in China.

Again, however, recent legislative efforts reflect an isolationist attitude hostile to international education programs. Upon the 50th anniversary of the Fulbright program, America's most prominent international student exchange program, Congress cut the program's budget by nearly 20 percent. And despite the obvious growth in importance of China and the rest of Asia, federal and foundation support for Americans to study in China has actually declined. Other proven U.S. initiatives regarding Latin American and African countries have also experienced tragically shortsighted funding cuts.

GLOBAL INSTITUTIONS

Still, the globalization of New England higher education gains steam. And admissions is not the only campus administrative function that is being colored by the process.

New England Manufactured Exports and Education Exports

	Manufactured Ex	Foreign Students		
	1995 Value	Rank	1994 Total	Rank
Canada	\$9,302,902,000	1	2,693	3
Japan	\$2,365,012,000	2	3,875	1
United Kingdom	\$2,358,767,000	3	1,001	8
Germany	\$1,695,862,000	4	969	9
Netherlands	\$988,344,000	5	202	N.A.
France	\$959,189,000	6	664	15
Taiwan	\$853,695,000	7	1,868	7
Korea	\$846,478,000	8	2,436	5
Singapore	\$761,475,000	9	341	N.A.
Hong Kong	\$738,031,000	10	768	12

A growing number of New England college alumni — foreign and native-born — live and work abroad. Their perspectives on curriculum are needed — and so is their support for endowed professorships and sponsored research.

One of the more developed international operations may be found at the Massachusetts Institute of Technology. MIT works with 92 organized alumni associations around the world, 50 in the United States, 12 in Europe, and the rest in places such as Tokyo and Singapore. MIT alumni frequently represent the top economic strata in their countries, and alumni functions are high-powered events. A recent meeting of MIT's Swiss alumni association on the commercialization of technology, a matter of great competitiveness within the European Union, drew speakers and guests from across the continent.

In Germany, MIT alumni have worked for three years to create a tax-exempt fund to support scholarships for German students to attend MIT. The German government not only approved the fund — the first of its kind in Germany — but also stipulated that the *Studienstiftung des Deutschen Volkes* would provide up to \$1 million to match German alumni gifts to the fund. MIT alumni groups in Italy and elsewhere are attempting to follow the German association's lead.

(Quite apart from the alumni operations, the MIT Industrial Liaison Program operates offices abroad providing consulting and advisory services to business and industry.)

Some New England institutions are becoming truly multinational organizations. Recently, St. Michael's College in Vermont, which is already well-established in international education circles, began exploring joint relationships with colleges and universities in Thailand, Malaysia, Indonesia and Korea — and the possibility of delivering programs to an international market via the Internet.

In 1991, the University System of Maine launched a bold and delicately funded venture called the American University of Bulgaria (AUB), drawing students from Bulgaria, and later from Albania, Lithuania, Poland, Macedonia, Romania and Russia. AUB students, all of whom were required to

take the SAT in English, posted average combined SAT scores of 1231, compared with a U.S. average of 1000. The university's 1995 and 1996 bachelor's degree graduates posted a 95 percent career placement or graduate school acceptance rate.

But as Robert L. Woodbury, former UMaine System chancellor and founding AUB trustee, explained, "There simply is no money in Bulgaria." The Soros Foundation and the U.S. Agency for International Development have recently committed \$15 million each toward sustaining the AUB by underwriting need-based student aid.

The St. Michael's and AUB experiences underscore a rethinking of New England's traditional international orientation. In short, the region's historical connections to Canada and Western Europe are, by economic and cultural necessity, being melded with a clearer understanding of fast-growing nations in Asia and Latin America and the newly free nations of Eastern Europe.

The top seven countries of origin for foreign students in New England include six Asian countries: Japan, China, India, Korea, Taiwan and Thailand. And though Asian and Latin American countries buy just 34 percent of New England's manufactured exports, that share is growing dramatically.

Western Europe, in contrast, buys 32 percent of New England's manufactured exports — but the region's exports to France, Germany and the Netherlands actually declined over the past five years. And Western Europeans account for only about 10 percent of the region's foreign students.

Yet those New England students who study abroad still overwhelmingly choose Western European destinations, and foreign language students here tend to study primarily Western European languages.

This sort of mismatch is increasingly worthy of attention. For in the waning years of the 20th century, students and faculty at New England's 260 colleges and universities will lead a process of internationalization that will likely touch every aspect of New England life in the 21st.

John C. Hoy is president of NEBHE and publisher of CONNECTION.

Resources

Boston Center for International Visitors Boston, Mass.

Nonprofit organization works with the U.S. Information Agency to arrange itineraries and social activities in Boston for visiting professionals from more than 100 countries.

Center for International Business and Economic Development Bryant College Smithfield, R.I.

Integrated center for statewide economic development includes three trade-oriented units: Rhode Island World Trade Center, Rhode Island Small Business Development Center and Rhode Island Export Assistance Center.

Center for International Business Education and Research University of Connecticut Storrs, Conn.

Academic center funded by U.S. Department of Education offers various education programs, sponsors research and provides outreach to businesses and professionals primarily on issues of global technology management.

Connecticut Economic Resource Center Rocky Hill, Conn.

Private, nonprofit organization links 40 banks, academic centers and other public and private trade resources in Connecticut.

Connecticut International Trade Association East Granby, Conn.

Nonprofit business group raises awareness of trade issues and awards annual scholarship to a student pursuing a career in international business.

New England and the World

The Global Economy: Where Does New England Fit In?

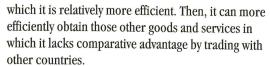
Richard J. DeKaser

Nations are engaged in more international trade than ever before, binding their economies closer and closer together. Advances in communication and transportation technology have accelerated the global flow of goods and services. At the same time, many countries that once had centrally planned economies, particularly in Eastern Europe and Latin America, are embracing free market institutions to a greater extent than in the past, thereby establishing common ground for trade and investment.

The question of whether this global integration is a

good thing or not tends to flare up in public debate, especially when international trade treaties are under consideration. Yet economists consistently express a rare level of agreement in support of free trade and open markets.

The basis for their support is the principle of comparative advantage. The principle, first articulated centuries ago, says that even if a country possesses an absolute advantage in producing all goods or services, it can still benefit from trade by reallocating its resources to the production of those goods and services in



So, for example, even if basketball star Michael Jordan were a terrific accountant, it would nevertheless make economic sense for him to focus on playing professional basketball while paying others to do his accounting. Similarly, although the United States produces both software and shoes more efficiently than Thailand, it tends to deploy more resources to produce software, which has a higher value in world markets, while it trades for shoes, which have a lower value.

Still, while the principle of comparative advantage provides a framework for understanding how reduced barriers to trade benefit the United States as a whole, it does not necessarily follow that all regions of the country will benefit equally. More likely, there will be winners and losers, depending mostly on which goods and services regions specialize in.

NEW ENGLAND'S PLACE

On balance, New England is well-positioned in the global economy. But the region faces difficulties as well.

New England's trade ties to the rest of the world consist of both goods and services flowing into and out of the region. The regional impact of *imports* tends to be poorly understood. After foreign-made goods arrive at customs areas — whether Logan Airport or a border checkpoint in Vermont — they travel to their ultimate destinations without further documentation, making it difficult to figure out if regions differ much on this basis. Service sector imports are even tougher to track.

Exports of goods and services are a different matter. Because exports of goods are the most measurable indi-



cator of global economic position, a variety of government agencies publish data and reports on exporting. The message they consistently convey is that New England is among the most export-dependent regions of the United States.

According to the most recent data available, New England in 1992 ranked first or second among the nine regions of the country on three basic measures of manufacturing export intensity: exports as a share of all manufactured goods; exporting businesses as a share of all businesses; and export-related manufacturing employment as a share of total manufacturing employment. Moreover, every New England state had above average export intensities by these measures, and three states — Massachusetts, Connecticut and New Hampshire — tied for first among all states in their shares of exporting businesses.

New England differs from the rest of the country, however, in terms of where it sends its wares. Canada and Western Europe account for two-thirds of New England's merchandise exports, but less than half of the nation's — hardly surprising given the region's Atlantic Rim location and historical connections to Europe. The corollary, of course, is that New England's exports are underrepresented in the developing countries of Latin America and Asia — markets that have accounted for evergrowing pieces of the overall U.S. export pie in recent years.

Another difference concerns the kinds of merchandise the region exports. Raw materials constitute a much smaller proportion of New England's foreign shipments than machinery, electronics and instrumentation. In fact, the latter three industries account for 57 percent of New England's merchandise exports, but just 38 percent of the nation's.

SERVICE DATA LACKING

Understanding the region's trade in services, as opposed to manufactured goods, is difficult. Nationally, we know that services account for about one-fifth of all foreign trade — and they are growing in importance. But because services bypass the customs checkpoints that hard goods

must travel through, estimates of service exports at the state or regional level are practically nonexistent.

Major types of traded services include education, health care and travel, as well as intellectual property such as royalties and licenses. So, when a New England-based biotechnology company licenses a trade secret to an Asian firm, or a European student takes courses at a New England university, a service is being exported.

The Federal Reserve Bank of Boston has conducted research in an effort to get a handle on the magnitude of service exports in New England. First, the Fed examined which service industries were known to be major exporters nationally. Then, it identified whether or not those industries had a large presence in the region. The Fed's conclusion that "a majority of these industries play a larger role in New England than in the national economy" suggests that the service sector buttresses the region's export-intensive nature.

Export intensity does not necessarily imply that a region is well-positioned to benefit from the rising tide of globalization. If a region's industries are vulnerable to open markets and freer trade, the brave new world could be painful. U.S. apparel, toy and machine tool producers, for example, have all suffered tremendous losses in domestic market share to foreign suppliers in the past.

Fortunately, however, New England's merchandise exporters are predominantly concentrated in industries that have experienced rapid export growth and have favorable balances of trade — that is, exports exceed imports. The same is probably true in New England's service sector, where the major industries are generally the same ones that have shown the best growth and most favorable trade balances at the national level.

GLOBAL CHALLENGES

A strong case can be made then that New England is not only export-intensive, but that it also stands to benefit disproportionately from the global trend toward open markets and freer trade. There are challenges, however. One identified by past research at BankBoston is to increase New England's trade emphasis on developing

Resources

Council on International Educational Exchange New York, N.Y.

Nonprofit organization operates international exchange programs for high school and college students and faculty, including work, internship and volunteer programs abroad.

Global Business Alliance of New England Boston, Mass.

Network of more than 40 New England international chambers of commerce, business groups and others interested in promoting international trade and cultural ties. Encompasses specialized business groups such as the Atlantic Rim Network, British American Business Council of New England and New England-Latin America Business Council.

Harvard Institute for International Development Cambridge, Mass.

Public policy center affiliated with Harvard University conducts research and provides technical assistance to emerging countries on issues ranging from education to sustainable development, and operates WorldTeach program placing volunteers in certain developing countries.

Institute of International Education New York, N.Y.

Nonprofit organization designs and implements international programs for U.S. and foreign governments, corporations, foundations and universities, and provides data on foreign enrollment and cultural exchange programs.

Resources

LASPAU Cambridge, Mass.

Nonprofit organization affiliated with Harvard University runs exchange programs for college students in Canada, Latin America, the Caribbean and the United States.

Maine International Trade Center Portland, Maine

Nonprofit membership organization formed by merger of the Maine World Trade Association, Maine Education and Training Export Partnership and International Division of the Maine Department of Economic and Community Development, markets Maine products and services internationally and provides one-stop export assistance to Maine companies.

Massachusetts Council for International Education University of Massachusetts Amherst, Mass.

Consortium of Massachusetts public colleges and universities helps public campuses develop international programs and activities and coordinate certain offerings.

Massachusetts Educational Financing Authority Boston, Mass.

State authority established to help students and higher education institutions finance cost of education also markets Massachusetts colleges and universities to foreign students and offers special low-interest loan program for foreign students from selected countries.

economies.
Latin America and Asia, in particular, are increasingly important markets for U.S. exports.
But New England's historical and geographic circumstances have kept the region's focus

on slower-growing

market opportuni-

ties in Europe and Canada. In fact, despite New England's attractive mix of industries, merchandise exports from the region have grown relatively slowly over the past decade. The principal reason has been New England's orientation toward slower-growing markets.

Another challenge lies in obstacles to the promotion and protection of New England's service sector exports. Historically, U.S. success in reducing trade barriers has applied to goods like steel, wheat, automobiles and semiconductors. But New England's current strengths lie in less tangible items like software, financial services, biomedical technologies and insurance, where past trade treaties (and their enforcement) have had modest impact. Asian companies routinely clone U.S. software, and Latin American companies appropriate pharmaceutical patents almost without consequence. U.S. asset managers, meanwhile, have only recently started squeezing into many foreign countries.

Finally, trade ties are only one aspect of New England's place in the global economy. Foreign investment — that is, the flow of financial capital into and out of the region — is another tie to the rest of the world, albeit a less important one economically than exports. In recent years, trade flows between the United States and the rest of the world have been five times as large as direct investment flows.

Notably, New England attracts a disproportionately small share of foreign investment in the United States, while the region's companies have a penchant for investing overseas, usually to establish

Trade Ties: Canada and
Western Europe account for
two-thirds of New England's
merchandise exports, but less
than half of the nation's.

production facilities that directly serve overseas markets.

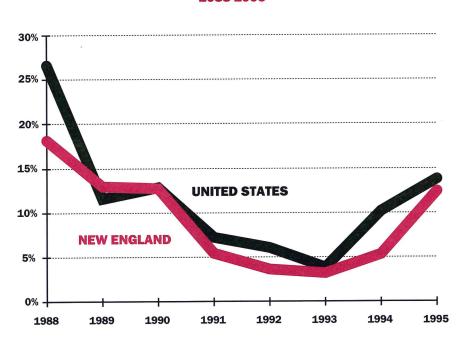
This imbalance in investment flows may not be as troubling as it first seems, however. Some states have paid a heavy price, usually in the form of tax subsidies, to secure foreign investment. Alabama, for example, recently granted subsidies amounting to \$200,000 per worker to secure a Mercedes-Benz plant. The foregone tax revenue makes the economic benefit of such foreign investment dubious. And foreign investment by New England companies is not necessarily a substitute for local investment, but rather a prerequisite to establishing a presence overseas. The ongoing process of European economic integration, for example, has more than a few U.S. companies establishing operations in Europe to ensure access to that market.

Ultimately, New England's global trade ties are both extensive and well-positioned in the general scheme of the nation's comparative advantage. But to fully exploit the region's strengths, New England businesses must overcome their traditional orientation toward mature markets and explore opportunities in developing countries. The region should also continue to push for greater enforcement of U.S. intellectual property rights abroad and better access to foreign markets for services in general. The stakes are high: New England's fit in the global economy will increasingly determine quality of life at home.

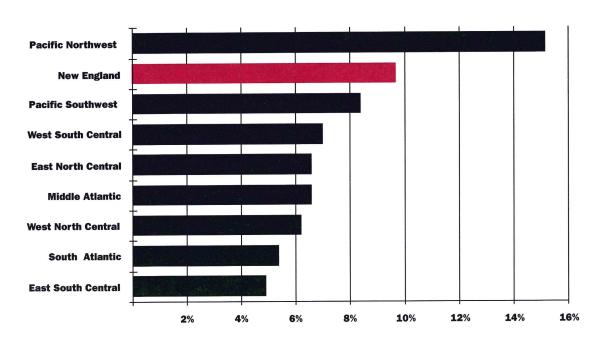
Richard J. DeKaser is senior economist at BankBoston and president of the New England Economic Project.

Exports: The World Buys New England Products





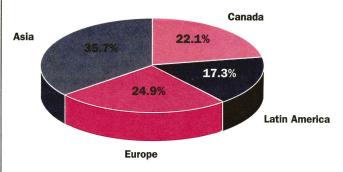
EXPORT-RELATED MANUFACTURING EMPLOYMENT AS A SHARE OF TOTAL MANUFACTURING EMPLOYMENT: 1992

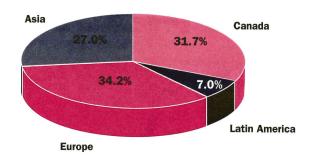


All trade data provided by the Massachusetts Institute for Social and Economic Research and BankBoston.

Export Trade

DESTINATIONS OF MANUFACTURED EXPORTS: AVERAGE 1993, 1994 AND 1995





UNITED STATES

NEW ENGLAND

DESTINATIONS OF U.S. AND NEW ENGLAND EXPORTS: 1990-1995 (Dollars in Thousands)

	United States			New England		
	1990	1995	% Change 1990-95	1990	1995	% Change 1990-95
Canada	\$82,966,541	\$126,024,133	51.9%	\$6,148,039	\$9,302,902	51.3%
Mexico	28,375,468	46,311,455	63.2	456,381	715,673	56.8
Central America	10,084,101	15,805,154	56.7	233,795	382,772	63.7
South America	15,612,189	34,203,623	119.1	413,073	780,080	88.8
Western Europe	110,786,911	131,739,662	18.9	8,331,364	9,282,286	11.4
Eastern Europe	6,456,640	8,733,211	35.3	256,990	355,521	38.3
Communist Asia	4,814,907	12,020,338	149.6	158,586	279,230	76.1
Japan	48,584,647	64,297,852	32.3	2,277,327	2,365,012	3.9
Middle East	11,198,060	17,395,993	55.3	333,376	448,270	34.5
South Asia	3,961,852	4,847,667	22.4	187,859	170,787	-9.1
Far East	51,697,362	98,382,897	90.3	2,175,304	3,986,748	83.3
Oceania	9,964,183	12,795,463	28.4	579,769	669,500	15.5
Africa	7,950,850	9,908,241	24.6	213,468	292,230	36.9
Total	\$392,975,324	\$583,030,525	48.4%	\$21,765,332	\$29,031,010	33.4%

NEW ENGLAND'S FASTEST-GROWING EXPORT MARKETS ...

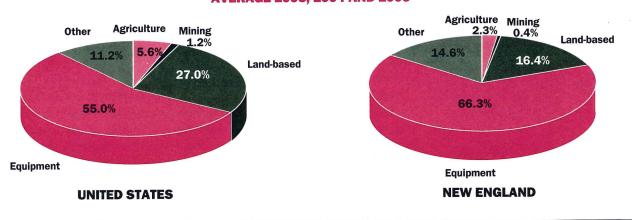
AND SLOWEST-GROWING EXPORT MARKETS

% Increase in Value of New England Exports	, 1990-95	% Change in Value of New England Exports, 1990-95		
Argentina	248%	Egypt	-18%	
Brazil	121	France	-9	
Hong Kong	116	Netherlands	-8	
Singapore	107	Germany	-1	
Malaysia	97	Turkey	0	
Commonwealth of Independent States	90	Belgium	3	
Thailand	90	Japan	4	
Colombia	83	Venezuela	7	
Taiwan	81	Australia	8	
South Africa	80	Italy	11	
China	72	United Kingdom	15	
Korea	62	India	16	
Mexico	57	Spain	17	
Canada	51	Israel	18	
Switzerland	43	Saudi Arabia	28	

EXPORTS BY INDUSTRY: 1990-1995 (Dollars in Thousands)

	United States			New England		
	1990	1995	% Change 1990-95	1990	1995	% Change 1990-95
Agriculture	\$26,303,802	\$34,371,097	30.7%	\$367,910	\$661,174	79.7%
Agriculture - Crops	22,616,926	30,161,147	33.4	59,161	162,319	174.4
Agriculture - Livestock	849,369	960,819	13.1	68,311	90,863	33.0
Forestry	294,822	297,063	0.8	10,875	17,360	59.6
Fishing & Hunting	2,542,686	2,952,068	16.1	229,563	390,632	70.2
Mining	7,011,792	7,214,047	2.9	86,413	72,424	-16.2
Metal Mining	1,267,309	1,586,101	25.2	33,921	23,110	-31.9
Coal Mining	4,514,266	3,573,757	-20.8	25,841	15,257	-41.0
Oil & Gas Extraction	477,298	733,557	53.7	731	452	-38.2
Nonmetalic Minerals	752,919	1,320,632	75.4	25,919	33,605	29.7
Manufacturing	346,339,062	529,014,590	52.7	20,371,355	27,392,817	34.5
Food Products	17,595,846	27,268,050	55.0	226,416	348,206	53.8
Tobacco Products	5,051,332	5,300,062	4.9	602	664	10.3
Textile Products	3.981.019	6,115,094	53.6	241,481	422,193	74.8
Apparel	3,080,610	7,655,886	148.5	48,376	241,084	398.4
Lumber & Wood	6,740,285	7,832,232	16.2	220,408	304,544	38.2
Furniture & Fixtures	1,688,572	3,233,513	91.5	36,508	65,568	79.6
Paper Products	9,127,442	15,730,890	72.3	580,529	990,760	70.7
Printing & Publishing	3,352,909	4,841,085	44.4	177,185	351,203	98.2
Chemicals	40,070,376	60,335,419	50.6	1,090,771	1,682,894	54.3
Petroleum & Coal	7,096,263	6,148,123	-13.4	115,427	55,830	-51.6
Rubber & Plastics	6,654,751	11,725,057	76.2	346,964	706,349	103.6
Leather Products	1,575,114	1,777,548	12.9	308,309	303,918	-1.4
Stone, Clay & Glass	3,795,201	5,079,140	33.8	160,180	159,075	-0.7
Basic Metals	13,331,497	21,607,081	62.1	436,519	663,287	51.9
Fabricated Metals	11,851,737	16,245,059	37.1	844,170	1,094,980	29.7
Industrial Machinery	67,628,347	105,947,587	56.7	5,936,388	6,277,142	5.7
Electronic Equipment	44,530,864	92,203,528	107.1	4,408,895	7,697,057	74.6
Transportation Equipment	71,554,837	87,722,920	22.6	2,244,369	2,495,809	11.2
Instruments	21,219,535	32,312,268	52.3	2,586,065	2,999,947	16.0
Misc. Manufactures	6,412,525	9,934,050	54.9	361,793	532,306	47.1
Other	13,320,668	12,430,791	-6.7	939,654	904,595	-3.7
Scrap & Waste	5,079,669	6,250,757	23.1	467,058	567,789	21.6
Used Goods	1,578,612	2,218,112	40.5	24,357	36,530	50.0
Goods Returned to Canada	888,372	1,660,649	86.9	71,873	111,542	55.2
Classification Provisions	5,774,015	2,301,272	-60.1	376,367	188,734	-49.9
Total	\$392,975,324	\$583,030,525	48.4%	\$21,765,332	\$29,031,010	33.4%

COMPOSITION OF MANUFACTURED EXPORTS: AVERAGE 1993, 1994 AND 1995



New England and the World

These School Ties Bind Continents

Stephen P. Tocco

The international pull of New England's colleges and universities enriches not only individual scholars, but also the region's economy and cultural life.

This year, an estimated 40,000 foreign college students are studying at New England campuses — about 9 percent of all international students enrolled in the United States, according to a New England Board of Higher Education analysis of data from the New York City-based Institute of International Education. Since 1990, foreign

> percent in New England, compared with 11 percent

From Africa, Asia, Europe and Latin America, many of those who travel to New England as students return to ers in government, business and the arts. Usually, the ties they establish here remain for life. So, world leaders in diverse fields feel a conneced States unlike any other. It's an emotional as well as an intellectual connection. And when it comes time for those former students to look for trading partners or expand markets, it becomes a practical connection.

Recently, Korean Air President Yang Ho Cho, who attended Harvard Business School in 1981 and is a frequent visitor to Boston, announced three times weekly service between Boston's

Logan Airport and Seoul, with an estimated \$17 million annual impact on the region's economy. Korea, which is New England's eighth largest trading partner, traces its education connections to the region back to 1883, when a young government worker named Yoo Kil Ju journeyed to Salem, Mass., for tutoring by Asia expert and science Professor Edward S. Morse of the Peabody Academy of Science. Yoo Kil Ju would later attend Governor Dummer Academy in Byfield, Mass., and after returning home, become a leader in Korea's independence movement.

enrollment has grown by 20 nationally.

their home countries as leadtion to this region of the Unit-

BUILDING NETWORKS

Now, the typical foreign student in Boston makes roughly 15 international trips to the Hub in a lifetime, traveling to school and returning to the city for class reunions, medical checkups, business meetings and to put children through college, according to an analysis by S.H&E International Consultancy, which has offices in the United States and the Netherlands. The connection produces an additional 32 trips on average by members of a foreign student's family.

Recently, the crown prince of Nepal, Dipendra Bir Bikram Shah Dev, arrived in Boston to visit Harvard University's Quincy House, where his father had lived as a student. Another Harvard alum, Sheik Yamani, the former oil minister of Saudi Arabia, visits Boston several times a year with his family.

Indeed, the list of foreign alumni of New England institutions reads like Who's Who. Architect I.M. Pei came from China to study in the region. So did former Pakistani Prime Minister Benazir Bhutto, former Canadian Prime Minister Pierre Trudeau and Mitsubishi President Minoru Makihar.

The benefits of foreign enrollment are varied. Many affluent and well-connected alumni support their alma maters financially and encourage other students in their home countries to study in New England. For example, Karim Aga Kahn, who studied at Harvard before assuming the role of spiritual leader to 15 million Ismaili Muslims. established the Center for Islamic Studies at Harvard and

Travel Bug: The typical foreign student in Boston makes roughly 15 trips to the Hub, traveling to school and returning to the city for class reunions, medical checkups, **business meetings** and to put children through college.

the Aga Kahn Program for Islamic Architecture at the Massachusetts Institute of Technology, both of which attract students and scholars from around the world. Meanwhile, Lebanese Prime Minister Rafik Hariri's \$10 million donation toward construction of Boston University's new nine-story School of Management building has benefited New Englanders from scholars to construction workers. Hariri's son attended BU.

Boston University alone enrolls nearly 5,000 foreign students — more than any other U.S. institution. "About one-third of undergraduates at our business school are international students who come to learn the business practices that have made America so successful," says Paul Green, BU's director of international undergraduate admissions. "They will go back to their countries having built networks or ties here."

A few years ago, a *Wall Street Journal* article noted that the finance ministers of Mexico, Chile and Argentina became friends while studying economics at Harvard and MIT during the 1970s. More recently, New England Council Chairman and BankBoston Senior Vice President Ira Jackson wrote in a *Boston Globe* column that schools are the "ties that bind" in global relations. "When President Fidel Ramos of the Philippines met with business executives here," observed Jackson, "he pointed out that seven of his nine cabinet members had attended colleges or universities in the Boston area."

While most foreign students return to their home countries to begin careers or start their own businesses, many stay in New England, often working for area businesses before starting their own companies. George Hatsopoulos, chairman and chief executive officer of Thermo Electron Corp. of Waltham, Mass., left Athens, Greece, for the Athens of America, and earned a doctorate at MIT. Today, the company he started in 1956 does \$2.2 billion in sales annually — an estimated 40 percent international.

Kymus Ginwala arrived at MIT from East Africa in 1949. In 1958, he and three incorporators started Northern Research and Engineering Corp. in Woburn, Mass. Within a year, the company, whose products include equipment to test helicopter engines, was doing business in Japan and England. "International students are less inhibited about engaging in international trade in the early stages of their businesses," says Ginwala. "It's natural. We are used to dealing with different cultures and often speak several languages." Northern now has 400 international customers, accounting for roughly 30 percent of the company's more than \$12 million in sales.

Finally, those international students who return home and start businesses frequently pursue international trade with companies in New England. One Taiwanese real estate developer who earned his MBA from the University of Massachusetts at Dartmouth is aggressively seeking a Massachusetts ceramic tile company for a joint venture with factories in Taiwan and Vietnam.

DOMESTIC COMPETITION?

Other states and regions increasingly recognize the economic and intellectual benefits that foreign enrollment brings, and New England's future leadership in attracting foreign talent is by no means assured.

As part of an effort to ensure the region's continued prominence as a destination for foreign students, the Massachusetts Port Authority and the Massachusetts Educational Financing Authority (MEFA) last year collaborated on a 32-page, four-color marketing piece describing the state's history, arts and entertainment offerings, and profiling more than 60 Massachusetts colleges and universities. The piece, *Discover Massachusetts: A World Class Education*, was distributed through 250 educational centers in 70 countries and made available at U.S. embassies.

Massport and MEFA have also recruited higher education institutions including Northeastern University, Bentley College and Framingham State College to attend student trade fairs in Latin America and Asia.

We cannot afford to be complacent. Aggressive, cooperative recruiting of foreign students today will provide New England with vital links to the Bhuttos, Peis, Yamanis and Trudeaus of the 21st century.

Stephen P. Tocco is executive director of the Massachusetts Port Authority.

Resources

Massachusetts Export Center Boston, Mass.

Cooperative effort of the Massachusetts Small Business Development Center, Massachusetts Port Authority, Massachusetts Development Finance Agency, Massachusetts Office of International Trade and Investment and Massachusetts Office of Business Development to provide one-stop export assistance.

Massachusetts Port Authority Boston, Mass.

State authority known as Massport, which owns and operates Logan International Airport and other port facilities in Greater Boston, also runs trade development and tourism promotion programs.

NAFSA-Association of International Educators Washington, D.C.

Nonprofit organization sets standards of good practice, supports education and training of international admissions officers, teachers of English as a Second Language and others involved in international exchange programs, and helps member institutions comply with regulations affecting foreign students and scholars.

National Council of World Affairs Organizations Washington, D.C.

National coalition of more than 80 nonprofit World Affairs Councils, which promote international awareness through activities such as forums, international exchanges, K-12 curriculum development and directories of international organizations. New England World Affairs Councils in Boston; Durham, N.H.; West Hartford, Conn.; Portland, Maine; Providence, R.I.; Springfield, Mass.; and Stamford, Conn.

New England and the World

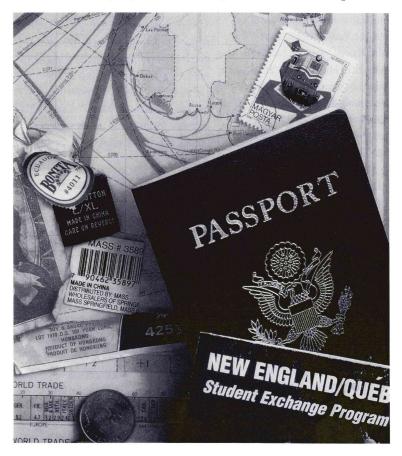
International Education for a Multipolar World

Claire L. Gaudiani

Global change demands new knowledge, better ways of working together and a profoundly international outlook. Higher education must make sure graduates are prepared for a newly interconnected world.

Unfortunately, most international education has been geared to students majoring in international fields — future specialists. But what about students in other fields from art history to zoology?

Connecticut College has tried to bring an international perspective to all undergraduate liberal arts disciplines.



The college's Center for International Studies and the Liberal Arts offers an international studies certificate for majors in any discipline who take certain courses; demonstrate State Department-level oral proficiency in a foreign language; undertake a college-funded summer internship abroad; and complete an integrative senior thesis on international issues ranging from China's one child per family policy to the impact of socialized medicine on health care in Russia. The center was recently renamed in honor of the late alumna and New York philanthropist Joanne Toor Cummings, whose \$4 million bequest partly endows the center's operations.

The internships infuse classroom learning with real-world international experience. Martin Lopez, a senior from Arlington, Mass., who is majoring in economics and Asian Studies, spent the summer researching Chinese civil aviation as an intern at the Beijing Pan-Asia Market Research Institute. Cory Freedland, a senior from Los Angeles, majoring in psychology and religion, worked at Takiwasi, a nonprofit drug rehabilitation center in Tarapolo, Peru.

The college's emphasis on international awareness is particularly compelling in light of the forces that are shaping America's international future.

Global communications. On a blustery cold January day in 1903, Italian engineer Guglielmo Marconi perched himself atop the high dunes of South Wellfleet, Mass., and sent the first transatlantic wireless signal from American shores to Poldhu, Cornwall, in England. Marconi's transmission presaged a century of communications advances from television to satellite dishes, e-mail and cellular phones. These devices have drawn the world closer together and helped create a common set of human aspirations. Through the distorted version of life shown in pixels, people around the world develop a universal hope of clean water, medical care, housing, jobs and rights of

speech and religion. If the steelworker in Bonn watches the same TV program as a Bedouin Arab, what does that mean for trade and migration patterns?

Global competition. Businesses face increasing international competition. An estimated 80 percent of U.S. companies today face global competitive pressures, compared with 15 percent in 1960.

New England companies from General Electric Co. of Fairfield, Conn., to Medica Corp. of Bedford, Mass., are seeking or expanding overseas markets. To prosper, companies need to design products for customers around the world. But will local cultures define local markets? Or might a global or U.S. culture increasingly overpower and homogenize world markets?

Moreover, competition will inevitably encourage more U.S. companies to send production offshore. Will they pay fair wages and pursue good environmental practices at their facilities abroad? What protections do their American workers deserve?

Multipolar global politics. Twentieth Century Fund President Richard C. Leone recently observed: "By historical standards, we have barely emerged from the Cold War era and are just beginning to move into the phase of awkward adjustment to new, developing realities." We are only now beginning to understand the ramifications of the shift away from the U.S.-Soviet bipolarism that marked the period following World War II. A new multipolar structure not only creates new trading partners, but also presents new challenges evident, for example, in the many regions seething with renewed tribalism and ethnic conflict.

New England colleges and universities have contributed significantly to the development of America's democracy and market economy. But for the past half century, their intellectual energies have been focused on fighting the Cold War. In the new multipolar world, New England's creative power should be harnessed to encourage democracy and build markets abroad. The region's colleges and universities can contribute by pursuing the following:

Help build a globally competitive workforce. The reputation of America's democracy and the strength of its economy depend on continued improvement in K-12 and higher education, especially among the poor. Though diversity is one of the nation's great strengths, U.S. colleges and universities should adopt tests marked by the rigor of those given in homogeneous nations like Japan and Sweden to test America's heterogeneous student population. We must show the world that U.S. students can meet global standards.

Social disequilibrium in families and communities has threatened the strength of the U.S. workforce during the past 20 years. The region's governors, legislators and leaders of business and higher education should collaborate on a New England Plan for Global Workforce Competitiveness, perhaps entailing new regionwide assessments of educational performance, projections of future workforce demands and strategies to give students hands-on experience in the region's internationally oriented businesses and nonprofit organizations.

Support overseas internships. Businesses know the global challenge firsthand. Faculty and students, field by field, need to understand what is going on overseas too. Colleges and corporations should develop clear goals for study-abroad and overseas internship programs. Corporations should receive a dollar-for-dollar tax credit to fund semester-long study for college faculty and students in G-7 and developing countries.

Internships and shorter trips might involve specific studies designed to link both faculty and students with appropriate professionals in the target country. Working projects could be continued via telecommunications technology. Indeed, Connecticut College has been experimenting with this cooperative approach, without corporate sponsorship, in its Study Abroad Teach Abroad program, which pairs teams of 15 to 30 students with two faculty members to study together in less-traveled countries.

Teach "humane" skills. This fractious transition time in global affairs requires Americans to possess not only critical skills like writing, quantitative reasoning and for-

Resources

National Foreign Language Center Washington, D.C.

Research and policy institute affiliated with Johns Hopkins University strives to improve U.S. foreign language competency and sponsors National Council of Organizations of Less Commonly Taught Languages.

New England-Canada Business Council Boston, Mass.

Nonprofit organization sponsors conferences on New England-Canada political, business and cultural ties, as well as the Maple Leaf Student Exchange for Canadian and U.S. high school students.

New Hampshire International Trade Association Portsmouth, N.H.

Nonprofit membership organization provides New Hampshire businesses with trade services, including networking, education and customized export assistance.

New Hampshire International Trade Resource Center Portsmouth, N.H.

Joint venture of state, federal and private organizations provides one-stop export assistance to New Hampshire companies and publishes exporter's handbook and resource directory.

New Hampshire Port Authority Portsmouth, N.H.

State authority responsible for managing New Hampshire tidal waters operates Foreign Trade Zone in Portsmouth and coordinates various trade development efforts.

Resources

Rhode Island Economic Development Corp. Providence, R.I.

State agency responsible for general economic development in Rhode Island promotes the Ocean State as a tourist destination and provides businesses with trade services in cooperation with the Rhode Island Export Assistance Center at Bryant College.

Scandinavian Seminar Amherst, Mass.

Nonprofit organization offers total immersion, year-abroad program for U.S. college students as well as exchange programs and short-term study programs for senior citizens.

School for Field Studies Beverly, Mass.

Educational institution offers undergraduate environmental field courses in Kenya, British West Indies, Pacific Northwest Canada, Mexico, the Republic of Palau, Costa Rica and Australia for credit from Boston University or SFSaffiliated colleges and universities.

Translation Center University of Massachusetts Amherst, Mass.

Academic center provides foreign language translation services for clients ranging from hospitals to high-tech companies.

U.S. International Trade Administration Washington, D.C.

Agency of U.S. Department of Commerce contributes to trade policy and publishes data on international trade. Operates New England export assistance centers in Middletown, Conn.; Boston and Marlboro, Mass.; Portland, Maine; Portsmouth, N.H.; Providence, R.I.; and Montpelier, Vt.

eign languages, but also skills such as negotiation and conflict mediation. The power of omnipresent media requires the best oral communication skills. The complexity of most work settings requires team-building and team-sustaining skills. The exploratory nature of most tasks — especially learning — requires entrepreneurial skills.

All these skills can be developed at minimal expense. Connecticut College offers a "Dean's Term" during the last week of winter break featuring courses on negotiation, public speaking and communication in a diverse society.

Build capacity for teamwork. Twoand four-year colleges should include among basic graduation requirements a team project by two or more students exploring a major contemporary problem in the United States, a G-7 country and a developing nation. The World Wide Web provides the framework for this exploration. Faculty should assess these triangulated studies carefully, ensure their factual reliability and place them on a New England-Global Challenge Web page to begin building a resource for faculty and other students.

Restore education's civic

dimension. Educators must develop international studies for the 21st century in the context of America's domestic diversity and its post-Cold War, multipolar, multilateral global setting. Colleges should work together to create statewide "institutes," bringing together faculty and staff, business people and community leaders to explore civic culture, markets and the future of democracy here and abroad. Clearly, American students must understand the framework of American democracy, as well as the responsibilities, aspirations and expectations of communities, if they are to thrive in a global economy.

Economist John Kenneth Galbraith has noted: "No country can be comfortable and content in its affluence if others are abjectly poor." The Marshall Plan — the

most successful effort in history to generate prosperity in the aftermath of war — offers a practical corollary: when we help others, we too prosper.

Working to create greater global prosperity creates more markets for our own products. Already, exports are of increasing importance to New England's economy. Between the first quarter of 1995 and the first quarter of 1996, exports grew in all New England states except Rhode Island. Massachusetts exports grew by 18 percent to more than \$4 billion in the first quarter of 1996, while Connecticut exports grew by 14 percent to \$1.8 billion.

Having lost tens of thousands of defense jobs in the recession from 1987 to 1992, New England's economic picture is not all rosy. But exports clearly are a key factor in the region's full economic recovery.

Many New England companies' customer bases are beginning to look like Rayonier's. The Stamford, Conn.-based global supplier of specialty pulps, timber and wood products conducts some 60 percent of its business internationally in 70 countries.

In its 1995 annual report, General Electric noted that non-U.S. revenues have grown from 20 percent of the company's total 10 years ago to 38 percent, and will account for the majority of GE's revenue "somewhere around the millennium."

New England's trading partners are changing too. Canada remains the region's No. 1 export market, but Asian customers are gaining in importance. Connecticut's No. 2 customer is Japan. And Mexico, Singapore and Korea rank sixth, seventh and eighth, respectively. We must broaden our horizons to better understand New England's future trading partners.

In the multipolar world, international education must be reconceived not only to ensure New England's prosperity, but also to achieve global stability and improve the lives of the poor. Like Marconi, we must see the possibility of new connections and then begin sending the right signals.

Claire L. Gaudiani is president of Connecticut College.

Foreign Enrollment: Beating a Path

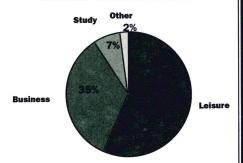
ECONOMIC IMPACT OF OVERSEAS VISITORS TO NEW ENGLAND

 Visitors
 1,292,000
 1,342,000
 4%

 Estimated Direct Spending
 \$1,043,000,000
 \$1,195,000,000
 15%

 Estimated Economic Impact
 \$2,086,000,000
 \$2,390,000,000
 15%

REASONS FOR OVERSEAS VISITS TO NEW ENGLAND: 1995

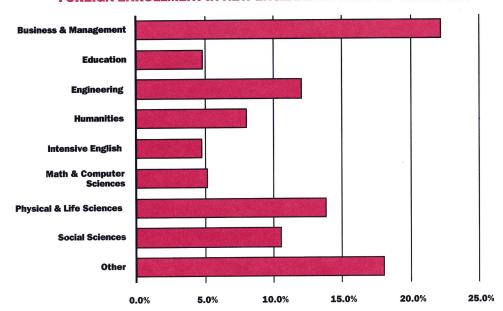


% Change

FOREIGN STUDENT ENROLLMENT IN NEW ENGLAND: FALL 1983 TO FALL 1995

								/0 Ollaligo
	1983	1985	1987	1989	1991	1993	1995	1983-1995
Connecticut	3.695	3,906	4,010	4,636	5,219	5,839	6,099	65.10%
Maine	382	377	615	902	1,123	1,360	1,240	224.61
Massachusetts	16,428	17,652	18.946	20,840	22,639	24,327	25,739	56.68
New Hampshire	857	934	1,288	1,262	1,469	1,793	1,928	124.97
Rhode Island	1.263	1,468	1.711	1,858	1,944	2,275	2,990	136.74
Vermont	566	614	1,132	1,206	897	923	815	43.99
New England	23,191	24,951	27,702	30,704	33,291	36,517	38,811	67.35
United States	338,894	343,777	356,187	386,851	419,585	449,749	453,787	33.90
New England								
as a % of U.S.	6.8%	7.3%	7.8%	7.9%	7.9%	8.1%	8.6%	

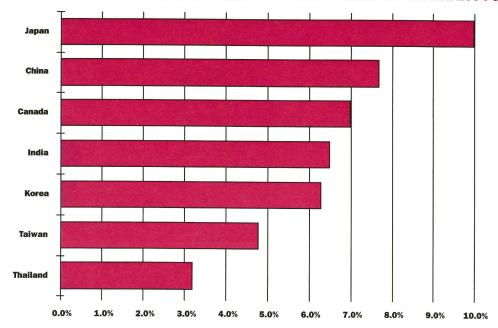
FOREIGN ENROLLMENT IN NEW ENGLAND BY FIELD OF STUDY: 1994-95



Data on overseas visitors provided by U.S. International Trade Administration and Massport. Data on foreign enrollment provided by Institute of International Education and prepared by Sue Klemer of NEBHE.

Foreign Enrollment

FOREIGN ENROLLMENT IN NEW ENGLAND BY LEADING PLACES OF ORIGIN: 1994-95



LEADING DESTINATIONS OF U.S. STUDENTS ABROAD: 1994-95

	Number of U.S. Students	% of All U.S. Students Abroad
United Kingdom	19,410	23.0%
France	7,872	9.3
Spain	7,473	8.9
Italy	7,062	8.4
Mexico	4,715	5.6
Germany	3,504	4.2
Australia	3,346	4.0
Israel	2,621	3.1
Costa Rica	2,302	2.7
Japan	2,212	2.6
Austria	1,489	1.8
Russia	1,290	1.5
China	1,257	1.5

LEADING PLACES OF ORIGIN OF FOREIGN STUDENTS IN THE UNITED STATES: 1995-96

	Number of Students in U.S.	% of All Foreign Students in U.S.
Japan	45,531	10.0%
China	39,613	8.7
Korea	36,231	8.0
Taiwan	32,702	7.2
India	31,743	7.0
Canada	23,005	5.1
Malaysia	14,015	3.1
Indonesia	12,820	2.8
Thailand	12,165	2.7
Hong Kong	12,018	2.6
Germany	9,017	2.0
Mexico	8,687	1.9
AND IN 1962-6	3	
Canada	7,004	10.8%
India	6,152	9.5
Taiwan	5,526	8.5
Japan	2,934	4.5
Iran	2,824	4.4
Korea	2,233	3.5
Philippines	2,025	3.1
Hong Kong	1,695	2.6
Cuba	1,515	2.3
Greece	1,432	2.2
United Kingdom	1,432	2.2
Israel	1,208	1.9
Mexico	1,189	1.8
Egypt	1,136	1.8

ESTIMATED FOREIGN STUDENT EXPENDITURES AND JOB CREATION IN NEW ENGLAND: 1993

	Foreign	Cost-of-Living	Tuition & Fee	Total	Jobs
	Students	Expenditures	Expenditures	Expenditures	Created
Connecticut Maine Massachusetts New Hampshire Rhode Island Vermont	5,839	\$50,974,470	\$53,546,816	\$104,521,286	1,187
	1,360	11,872,800	11,014,916	22,887,716	321
	24,327	212,374,710	263,386,234	475,760,944	6,350
	1,793	15,652,890	17,145,704	32,798,594	449
	2,275	19,860,750	22,073,375	41,934,125	561
	923	8,057,790	10,440,137	18,497,927	298
New England United States New England as a	36,517 449,749	\$318,793,410 \$3,912,916,950	\$377,607,182 \$3,016,932,704	\$696,400,592 \$6,929,849,654	9,166 101,456
% of United States	8.1%	8.1%	12.5%	10.0%	9.0%

U.S. INSTITUTIONS ENROLLING THE MOST FOREIGN STUDENTS: 1994-95

U.S. Rank	Institution	City	State	Foreign Students	Total Enrollment	Foreign Students as a % of Enrollment
1	Boston University	Boston	Mass.	4,734	28,664	16.5 %
2	University of Southern California	Los Angeles	Calif.	4,259	27,465	15.5
3	University of Wisconsin	Madison	Wis.	3,964	40,305	9.8
4	New York University	New York	N.Y.	3,832	35,410	10.8
5	Ohio State University	Columbus	Ohio	3,760	49,542	7.6
6	University of Texas	Austin	Texas	3,753	49,617	7.6
7	Columbia University	New York	N.Y.	3,644	19,547	18.6
8	Harvard University	Cambridge	Mass.	3,410	18,100	18.8
9	University of Pennsylvania	Philadelphia	Pa.	3,168	20,130	15.7
10	University of Illinois	Champaign	III.	3,064	36,191	8.5
11	University of Michigan	Ann Arbor	Mich.	2,748	36,468	7.5
12	University of Houston	Houston	Texas	2,646	32,129	8.2
13	Texas A&M University	College Station	Texas	2,627	41,171	6.4
14	University of Minnesota	Minneapolis	Minn.	2,606	36,699	7.1
15	George Washington University	Washington	D.C.	2,591	19,298	13.4
16	Stanford University	Stanford	Calif.	2,587	15,175	17.0
17	Cornell University	Ithaca	N.Y.	2,567	19,271	13.3
18	Iowa State University	Ames	Iowa	2,495	24,728	10.1
19	Southern Illinois University	Carbondale	III.	2,485	24,083	10.3
20	University of Maryland	College Park	Md.	2,484	32,493	7.6

NEW ENGLAND INSTITUTIONS ENROLLING THE MOST FOREIGN STUDENTS: 1994-95

U.S. Rank	Institution	City	State	Foreign Students	Total Enrollment	Foreign Students as a % of Enrollment
1	Boston University	Boston	Mass.	4,734	28,664	16.5%
8	Harvard University	Cambridge	Mass.	3,410	18,100	18.8
24	Northeastern University	Boston	Mass.	2,383	28,154	8.5
32	MIT	Cambridge	Mass.	2,148	9,774	22.0
45	UMass-Amherst	Amherst	Mass.	1,838	23,635	7.8
76	Yale University	New Haven	Conn.	1,340	10,998	12.2
78	University of Connecticut	Storrs	Conn.	1,283	26,443	4.9
92	Brown University	Providence	R.I.	1,146	7,793	14.7

New England and the World

Community College of the World

Carole A. Cowan and Frank M. Falcetta

Once upon a time, international education was widely perceived as an opportunity for wealthy White women attending high-priced, finishing schools to spend their junior year in Paris or Rome. Not anymore.

The transformation of international education is powerfully illustrated at Middlesex Community College. The associate degree-granting public college with campuses in Bedford and Lowell, Mass., has launched an array of international programs for its traditionally working-class students, as well as faculty and businesses in the Merrimack Valley and Boston's northwest suburbs.

A Ukrainian immigrant, an Italian-American from suburban Boston, a single mother who recently returned to college and dozens of other Middlesex students have spent summers studying in Beijing and Shanghai. The "China Experience," as the college's three-credit course in China is called, is indeed a life-changing experience for these students. The course includes a three-week study tour of seven Chinese cities and a three-day series of lectures at the East-West Center at the University of Hawaii. The program is funded partially by two Chinese provinces; students pay the regular course fee of \$300.

Besides broadening the intellectual and cultural horizons of students and faculty and staff, international education programs at Middlesex provide training and networking to businesses in a part of New England that is no stranger to the potency of global economic shifts. The Merrimack Valley once commanded the world textile market only to lose its plentiful mill jobs to overseas, as well as domestic, competition. Now, the area's high-technology, biotechnology, financial services, tourism and hospitality industries are flourishing. More than ever, their fortunes will depend on their international competitiveness.

Middlesex international business programs — some provided in collaboration with the Massachusetts Export Center and regional chambers of commerce through the Partners for Trade program — teach business people about letters of credit, pricing products and services in various countries and choosing distributors abroad. The international business programs have helped companies such

as Nova Biomedical and members of the Massachusetts Telecommunications Council develop international contacts and negotiate contracts with foreign companies and governments. Femcon Corp., a Marlborough, Mass.-based software developer, landed a contract with the stock market in Prague thanks to the programs.

The college also provides, for a fee, a wide range of training programs for international clients — in some cases, sending faculty around the globe to train managers and others. For example, Middlesex faculty have taught a Western-oriented financial accounting seminar in China for college accounting faculty from several Chinese provinces.

Meanwhile, high school English teachers



Exporting Knowledge:

The community college's international programs have tapped new revenue streams during a difficult budget period for public higher education in Massachusetts.

from Germany travel to Jack Kerouac's Lowell for Middlesex programs in American literature and English as a Second Language. High school students from the former Soviet Republic of Georgia journey to the community college's campuses to learn English, while bankers from the Kyrgyz Republic study American banking practices.

Middlesex also cooperates with other colleges and universities in reaching international clients. More than 200 Colombian high school teachers have spent recent summers studying English language and American culture at Middlesex, Bunker Hill Community College, Newbury College and the University of Massachusetts at Dartmouth.

Notably, the community college's international programs have also tapped new revenue streams during a difficult budget period for public higher education in Massachusetts. Middlesex's international programs have generated almost \$1 million during the past seven years in grants from the U.S. Department of Education, the U.S. Information Agency and the National Endowment for the Humanities, along with support from foreign governments and states and fees paid by area businesses.

Recently, Middlesex was awarded a \$111,000 grant from the U.S. Department of Education to launch two new initiatives. A new International Business Curriculum Infusion Center will help business faculty from New England's two-year and small four-year colleges globalize their curricula.

And the International Business Assistance Program will help 15 Massachusetts businesses, including five minorityowned firms, penetrate international markets.

The interest in international programs was a natural for Middlesex in the late 1980s, as the college opened a new campus in ethnically diverse Lowell, and the state began encouraging public institutions to specialize. Still, the international emphasis has changed the college in

profound, unanticipated ways.

As American-born students and faculty at Middlesex interact with foreign students, scholars, government officials and business people spending time on the Middlesex campuses during the year, they find their stereotypes challenged. South African scholars on campus give suburban Boston students a new understanding of the terror of apartheid. Irish Catholic and Irish Protestant college graduates spending the summer working together in the Lowell Public Schools see their differences melt away.

Moreover, Middlesex faculty who have taught in China, Russia, Africa or Asia have expanded their horizons — and that carries over to the classroom. When an economics professor describes China's difficult conversion to a market economy, he can cite reallife anecdotes from personal observations on the streets of Beijing or Shanghai.

"I tell my economics class that Chinese business people are sophisticated about business technology and customer service, but they retain an old-fashioned way of business negotiating," says economics Professor Michael Peregon. "They are willing to spend money and time to entertain their American guests. They conduct business at a much slower pace than we do with the hope of connecting personally with their clients before sealing the deal."

Carole A. Cowan is president of Middlesex Community College. Frank M. Falcetta is associate provost.

Resources

Vermont Export Assistance Center Rutland, Vt.

Nonprofit center affiliated with University of Vermont provides export assistance services including counseling, market research and foreign contacts.

Vermont Export Council Montpelier, Vt.

Standing committee of Vermont Chamber of Commerce encourages Vermont businesses to become involved in international trade and raises awareness of available export services.

Vermont World Trade Office Montpelier, Vt.

International trade unit of state Department of Economic Development provides one-stop export assistance to Vermont companies and encourages certain foreign companies to establish operations in the state.

Women in World Trade Boston, Mass.

Professional organization offers contacts and business opportunities for women involved in global trade.

World Learning Brattleboro, Vt.

Nonprofit organization operates the School for International Training, citizen exchange and language programs and voluntary activities in international development and training.

World Trade Centers Association New York, N.Y.

National association fosters cooperation among more than 300 World Trade Centers in 100 countries. New England affiliates in Boston, Providence, R.I., and Bridgeport, Conn., bring together business and government to help identify opportunities in international markets.

College Opportunity

The following is adapted from "College Opportunities and the Poor: Getting National Policies Back on Track" authored by Lawrence E. Gladieux, executive director for policy analysis at the College Board, and published recently by the College Board and the Center for the Study of Opportunity in Higher Education, a research affiliate of the National Council of Educational Opportunity Associations, which represents federally funded TRIO programs. TRIO programs (Upward Bound, Talent Search, Student Support Services, Educational Opportunity Centers and the Ronald E. McNair Post Baccalaureate Achievement Program) offer a range of services from tutoring to financial counseling to help students overcome social and academic barriers to higher education.

Thirty years ago, federal legislation created need-based grants and TRIO programs for the disadvantaged, while helping middle-class families with minimally subsidized loans of convenience. The policy drift since then has, in effect, stood that original commitment to equal opportunity on its head.

How can we start getting things back on track? How can we regain momentum toward a system that is affordable and equitable? National economic policies that restore real growth in wages and curb the growing disparities in the distribution of income would certainly help. But sticking to education policy and practice, here is a checklist of what we need to address:

Get college costs and prices under control. We need to be concerned not only with how students and families can afford a college education, but also with the other side of the equation: how colleges can provide it at lower cost. Making college affordable again will depend at least as much on restraining the growth of tuition and other charges as on providing more student aid.

Restore need-based standards. We need to refocus subsidies on the neediest students. While the broadening of eligibility has popularized aid programs with the middle class and strengthened the political base of student aid, the shift has diluted federal assistance for low-income students. Scarce dollars have shifted up the income scale at the expense of more disadvantaged students and families.

Find alternatives to loans for at-risk students. For those who complete their degrees, the economic returns on a college education are generally high, and debt levels are manageable for most. But we must question the wisdom of loan financing — and find alternatives — for some: low-income students unfamiliar with and liable to be deterred by debt, first-generation students struggling to survive academically and financially, and students training for low-paying fields.

Restore the purchasing power of Pell Grants. When Congress created Pell Grants, they were to be the main building blocks of federal policy to help low-income students attend and

complete college. And the early experience of the program was promising. The constant-dollar value of the Pell Grant reached its peak in the mid-1970s, and its availability no doubt contributed to the bit of progress we made during that period in closing gaps in college access. Since then, however, the maximum Pell Grant has steadily lost purchasing power and dwindled in significance relative to the cost of both public and private higher education.

Expand precollegiate outreach. Not only do we need to address the economic issues listed above, we also must reach out to more disadvantaged young people earlier in their schooling — to widen their horizons and encourage them to stay in school and make decisions that keep their options open. TRIO programs play a key role in providing such early and sustained intervention and to make college a realistic possibility for more young people from disadvantaged backgrounds.

Focus on student success, not just access. Just getting students in the door is not enough. Students may, in fact, be worse off if they have borrow to finance their studies but do not finish their programs: no degree, no skills and in debt. We need greater efforts to help at-risk students complete their degrees. Once again, the TRIO community has a big part to play.

The single most important objective we could set for the coming federal budget debates and the higher education reauthorization of 1997-98 would be restoring Pell Grants to their original promise and purchasing power. Doing so will not be easy. Boosting the maximum Pell award by just \$100 requires more than \$300 million in added appropriations. That means almost \$12 billion — twice the current appropriation — would have been needed to raise the top award in 1996-97 from its actual level of \$2,470 to the \$4,300 authorized by law. But the only way to regain the leverage and incentive that Pell Grants once represented in the 1970s is to force the maximum upward over time.

Needy in Connecticut

The following is adapted from the September 1996 "Fact Sheets," published by the Connecticut Department of Higher Education.

Connecticut has the highest per-capita income of any state in the nation. One might think that surely most Connecticut families can pay for their children's education. Unfortunately, per-capita income figures mask the fact that the majority of Connecticut families have incomes below the average for the state. What does this mean for already-strained college financial aid resources?

To determine the need for financial aid of Connecticut college-bound students, the state Department of Higher Education has compiled data on the number of state residents who, for the 1995-96 school year, completed the Free Application for

Federal Student Aid (FAFSA) — the form required of all students applying for federal financial aid.

The analysis shows that 90,294 Connecticut residents sought financial assistance to attend a college or postsecondary institution somewhere in the United States for 1995-96. Most aid applicants (56 percent) identified themselves as dependent students, reliant on parental income. Most are younger than 25 years of age (69 percent) and most are continuing students (66 percent). About one-quarter have other family members enrolled in college at the same time.

Looking at the "Effective Family Contribution" used in the federal methodology to calculate financial need reveals some startling facts about the ability of Connecticut students to pay for college. More than one-fifth of FAFSA filers are unable to make any contribution at all toward college costs. They have an Effective Family Contribution of zero. An additional 9 percent can contribute only up to \$1,000. In short, more than 30 percent of state residents seeking financial assistance cannot even cover the basic costs of full-time tuition and fees charged by a community-technical college in Connecticut.

The data further reveal that most students seeking financial assistance cannot contribute more than \$10,000 and, therefore, would need financial aid to attend any one of the four Connecticut State University (CSU) institutions as a residential student. And only 15 percent could contribute more than \$13,000 — enough to cover one year's tuition and expenses at the University of Connecticut, using family resources to live on campus.

Many Connecticut students who apply for aid are interested in attending public institutions in the state. Of the 25,542 applicants hoping to become new freshmen last fall, 4,416 included the University of Connecticut among their top five college choices. Yet, only one-quarter of those considering UConn could contribute more than \$13,000 toward the costs of college, leaving three-quarters of the pool dependent on financial assistance to attend the university.

Similarly, 4,585 noted one or more of the four CSU institutions among their top five choices. Only 22 percent of this group could contribute more than \$10,000, with the balance needing financial assistance. ...

Finances not only affect where students seek to attend college, but also how they attend. At UConn, undergraduates who could contribute only \$13,000 or less toward their college education were twice as likely to enroll as part-time students than were those who contribute more than \$13,000. At the CSU institutions, undergraduates whose capacity to pay was \$10,000 or less were 50 percent more likely to enroll as part-time students than were those who could contribute more than \$10,000.

Even at the community-technical colleges, students whose Effective Family Contribution was less than the annual cost of attendance were more likely to enroll part-time than were more affluent students. Attending part-time not only adds to the time it takes to earn a degree, it also is more expensive for the student and, due to spread-out administrative costs, for the institution — an impor-

tant implication for state policymakers.

A good many Connecticut residents need student financial aid to attend college. When they do not have the money, some respond by modifying their academic expectations. Some persist by adjusting how they attend. Others just opt out.

As federal financial aid programs provide less and less support and lead to more and more student debt, Connecticut residents will turn increasingly to the state for assistance.

In the past, Connecticut has provided local employers with one of the nation's most highly educated workforces. Will it continue to do so in the future?

The Light at the End of the Cable

The following is adapted from "The Light at the End of the Fiber-Optic Cable: Connecticut's Photonics Cluster" by University of Connecticut economics Professor William A. McEachern. The piece appeared in the October 1996 issue of The Connecticut Economy, a quarterly newsletter edited by McEachern and published by the University of Connecticut's Center for Economic Analysis. The New England Board of Higher Education has identified photonics as a key New England industry. With support from the National Science Foundation, NEBHE is conducting a series of workshops to prepare community-technical college faculty and high school teachers to teach fiber optics in their classrooms. NEBHE is developing a proposal to implement a similar program in laser technology. Both fiber optics and laser technology have applications in the photonics industry.

Economists have long recognized that firms in some industries gain a performance advantage by clustering — that is, by locating in a region already thick with firms in that particular industry or in related industries. Clusters such as Hollywood's movie business, Madison Avenue's advertising business and Silicon Valley's computer business facilitate communication and promote healthy competition among cluster members. The flow of information and cooperation among companies, as well as the competition among companies in close proximity, stimulate regional innovation and propel growth. Some economists now view firm clustering as the be-all and the end-all driving regional growth.

Connecticut's record of clustering goes way back. Maritime insurance companies sprang up to insure the whaling fleet, eventually diversifying to make Hartford an insurance center.

Manufacturing fed on the genius of Connecticut's inventors. Eli Whitney developed the idea of interchangeable parts for guns, and a big federal order helped build a musket factory in

Hamden, sowing the seeds of the state's defense industry. Eli Terry applied Whitney's idea of interchangeable parts to clockmaking in Plymouth. Textile companies such as American Thread, Willington Thread and Willimantic Linen sprang up in Eastern Connecticut, along with button factories, spool-makers and related activities.

Connecticut's Yankee ingenuity helped create a brass industry in the Naugatuck Valley, an industry that supplied a new nation with brass fittings. Plastic molding is trying to pick up in the valley where brass left off. Connecticut has long been reinventing itself, and — from hats in Danbury to tinware in Berlin — firm clustering has been a renewable source of the state's competitive advantage.

Much attention today centers on clustering of high-technology firms because of their high value-added and high pay. The attributes most conducive to growth of such clusters include an existing base of high-tech companies, specialized business services to serve those companies, a trained workforce, research universities, research and development laboratories, availability of venture capital and cultural amenities. Consider now what probably is one of the most promising high-tech industries: photonics.

In the 1960s movie *The Graduate*, Dustin Hoffman's character was given career advice in one word: "plastics." Today, that word might be "photonics." Photonics is the practical use of light to create new processes, new products and new services. A photon is a quantum of radiant energy — a unit of light. Photons can carry information, such as through fiber-optic communications, CD-ROMs and holography. Photons can retrieve information, such as with laser radar, satellite images and other sensor devices. And photons can transport light as power, such as with laser machining and laser surgery.

Photonics lands on everybody's list of hot, emerging industries in the information age, and has been identified as a critical technology worthy of federal support by both the departments of Defense and Commerce. A recent National Science Foundation panel called photonics "the technological foundation of an information-based United States economy in the 21st century." That panel found that impending breakthroughs in lasers and electro-optics would be "enormous in scale and virtually infinite in number."

How does Connecticut stack up in this promising industry? One crude calculus adds up the number of photonics firms in the state and compares this total with the total in other states. According to the University of Connecticut's Photonics Research Center, Connecticut was home to 136 photonics companies in 1995, making it one of only eight states with more than 100 firms in the field. In fact, Connecticut was home to more photonics companies as of last year than the bottom 20 states combined.

To put states of different sizes on a comparable footing, company totals can be adjusted for population. By this measure, Connecticut has 4.2 photonics firms per 100,000 people, ranking it third in the nation behind only Massachusetts with 6.1 companies per 100,000, and New Hampshire with 4.8. The top three states stand head and shoulders above the rest; New Jersey ranked fourth, with 2.4. And the national average was 1.2.

Eight of the top 10 states lie in the Northeast corridor, from Maryland to New Hampshire. More narrowly, five New England states rank in the top 10. These five states collectively include only about one-twentieth of the U.S. population, but account for about onefifth of U.S. photonics companies. So, photonics companies have clustered in the Northeast Corridor, especially in New England.

Since a major advantage of firm clustering is proximity, we can adjust each state's company total by land area to develop a measure of firm density, such as photonics companies per square mile. By this measure, Connecticut ranks second in the United States, again behind Massachusetts. Photonics companies in Connecticut are about 30 times more densely packed than the national average.

Connecticut is thus blessed with a promising photonics cluster. Because many of the companies are small — more than half have fewer than 50 employees — photonics employment still accounts for only about 11,000 Connecticut jobs. But the demand for trained technicians grows. One federal study projects that national demand for photonics technicians will double to 740,000 by the year 2000.

A group called the Connecticut Photonics Industry Cluster was formed earlier this year by a steering committee consisting of representatives from photonics, venture capital and higher education. In April, the group held its first conference, where industry representatives exchanged ideas and discussed ways the cluster could grow. The group called for more university research, but one of their main gripes was the lack of qualified technical people in Connecticut — a shortage that limits the growth of existing companies and discourages new firms from locating in the state.

In the past, industry could count on the armed forces to train a steady supply of photonics technicians, but military downsizing has decreased the number trained and hence the number entering the commercial workforce.

The only community-technical college in New England that trains photonics technicians is Springfield Technical-Community College in Massachusetts. Modest help began emerging in Connecticut last fall when several Connecticut high schools and community-technical colleges received three-year grants to train teachers in photonics to develop new courses in the field.

Government policies seem to have little to do with why industries cluster in the first place, but these policies can reinforce clustering once underway, especially by ensuring that the educational system is in sync with job requirements.

Photons are quickly replacing electrons as the basis for the information age. Connecticut has positioned itself to become a world leader in this emerging technology, but there are no guarantees. One thing is certain: research, education and training will play a critical role in the outcome.

Life After 40

The following is adapted from "Life After Forty: A New Portrait of Today's — and Tomorrow's — Postsecondary Students," a report published in the fall by The Education Resources Institute of Boston and the Washington, D.C.-based Institute for Higher Education Policy.

Between 1970 and 1993, the enrollment of students age 40 and older in higher education grew by 235 percent, from an estimated 477,000 to more than 1.6 million. The 40-plus group grew from 5.5 percent of total higher education enrollment in 1970 to 11.2 percent in 1993 — the largest jump of any age cohort. In contrast, students ages 18 to 24 dropped from 69 percent of total enrollment in 1970 to under 55 percent in 1993. Students 40 and older account for 10 percent of all undergraduates, 22 percent of all graduate students and 6 percent of all professional school students. ...

The long-term impacts that students over 40 might have on the system of postsecondary education — and on American society — are only now beginning to appear. They include the following:

The demographic wave of students over 40 could overwhelm the current infrastructure of traditional higher education institutions, especially when combined with the "baby boom echo" of students who will begin enrolling around the year 2000. While much has been written about the possible effects of the baby boom echo, little has been focused on the impact of the echo generation and their parents *simultaneously* participating in postsecondary education. The over-40 cohort could place extraordinary demands on colleges and universities, generating an even greater need to increase faculty and staff, build new and different facilities to accommodate more students and enhance student services.

Barriers to participating in postsecondary education will be reduced as employers play a larger role in the education and training of all Americans. Unlike the generation before them, the over-40 population has gained greater access to training through their workplaces and other providers. Since the 1970s, the number of corporate universities has grown from 400 to more than 1,000. The increased convenience and flexibility these entities offer has transformed the postsecondary education market. As a result, the historical concentration of postsecondary education and training in traditional colleges and universities will likely continue to be augmented by new providers.

Students over 40 will help to transform how postsecondary education is delivered. Despite the over-40 generation's lower comfort level with technology and computers, they have been major consumers of new teaching and learning tools. From distance learning to self-paced learning on computers, the process of postsecondary instruction continues to change rapidly. Students over 40, who generally do not enroll in residential programs or attend a traditional college or university full-time, are at the forefront of this trend.

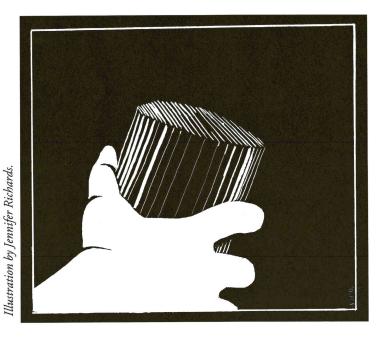
Students over 40 will have a major impact on how postsecondary education is financed. The changes now occurring in postsecondary financing — escalating tuition, exploding student loan borrowing, etc. — are only the beginning. As students over 40 grow as a proportion of the postsecondary population, their specific needs and circumstances will affect the entire financing system. Institutions will be compelled to adjust how they allocate resources due to the unique demands these adults place on student services. Institutions will also need to take into account the part-time, irregular attendance patterns of 40-plus students — and their higher family care and transportation costs — when awarding student aid. Furthermore, students over 40 will have to modify their own spending habits, particularly as many will face the prospect of simultaneously footing the bill for their children's education.

Americans over age 40 will be critical to the economic productivity of the nation and its global competitiveness. Numerous studies on worker productivity have pointed out that some of the greatest contributions workers make to the U.S. economy and to their specific fields occur after the age of 40. Because this population is the largest age cohort in history, it is likely to have the greatest economic and social impact on the nation.

Lifelong learning will increasingly become a reality for Americans. The expanding availability of postsecondary education to students over 40 has the potential to influence how much a person can learn over the course of his or her productive work life. As the need to upgrade skills continuously becomes a requirement for employers and employees, the notion of lifelong learning will become commonplace. This will significantly affect how people think about and approach work, including decisions concerning career changes, retirement and a host of other issues.

The increased participation of Americans over 40 in postsecondary education and training will contribute to the nation's social stability and well-being. As more citizens age 40 and older participate in postsecondary education and training, the benefits they reap as individuals will pay off for society as a whole. Research has shown that persons who have attended postsecondary education earn higher wages and have lower rates of unemployment and welfare participation. They also give back to society by performing more community service, voting at higher rates than others and contributing more in taxes.

Though still proportionally smaller than other age groups on campuses and in classrooms, the rapid growth of the over-40 group has placed it at the forefront of change and progress. The current experiences of students over 40 provide a vision for the future of education and training for all citizens, and in so doing offer a window to the future of our nation's prosperity.



Public Colleges and Universities Vie for New England's Elusive Philanthropic Dollar

JOHN C. SCHNEIDER

s New England public colleges and universities make their entree into big-time private fundraising, they must crack an age-old New England bias in favor of private institutions, a poor regional record in philanthropy and flat foundation and corporate support of higher education.

The first challenge is familiar. The relatively weak performance of New England's public colleges and universities in both state appropriations and private fundraising has been tied in various ways to the prominence of the region's private educational institutions.

One New England development official recently held out Pennsylvania State University as a model for New England public universities, noting that Penn State had raised \$350 million-plus in private funds during the late 1980s despite the proximity of prestigious private institutions such as the University of Pennsylvania and Swarthmore College (Connection, Spring 1996). But Pennsylvania is not New England.

Private colleges and universities are embedded in New England's history and culture. The region's 173 private higher education institutions represent two-thirds of the region's total and enroll nearly 50 percent of New England college students. Nationally, private institutions enroll just over 20 percent of college students. Five of the top eight U.S. universities in the 1997 *U.S. News & World Report* survey are New England inde-

pendents, as are five of the nation's top eight liberal arts colleges. Moreover, New England private institutions boast deep experience with fundraising. Even some of the region's prep schools have amassed quarter-billion-dollar endowments.

Still, the region's public colleges and universities, while overshadowed by the long and stunning record of achievement of their private counterparts, have become conspicuous features of New England's educational terrain. The case for their continued and increased state support is compelling. So is the argument for their planning ambitious private fundraising campaigns. Perhaps no one would expect the University of Massachusetts to launch a fundraising drive of the magnitude that Harvard might. But could UMass, for example, mount the sort of campaign that a Penn State or a University of Virginia can? (See sidebar.)

With their high-quality academic programs, committed administrations and volunteers, and skillful development staffs, the public universities are wise to envision larger fundraising initiatives than they have

The philanthropic soil in New England for public higher education may not be so infertile after all.

completed to date. The search for funds will take the region's public land-grant universities far and wide, where they will compete with peer institutions, public and private, for grants from major foundations, corporations, agencies and individual philanthropists with broad, national interests.

Yet, while many of New England's private institutions recruit nationally and internationally, and the best have gained greater access to the major foundations and other funders well beyond New England, the region's state-supported institutions need to be more attentive to the climate of philanthropy closer to home.

For these public institutions, long-term success depends on their ability to garner support from their *New England* constituencies: alumni, parents, friends, foundations with regional interests and corporations with head-quarters or operations in the region. Here too, the publics will compete with the private institutions, even within individual households where a parent with a degree from the University of Vermont might be sending a daughter to Wellesley College. They will also face hard realities about New England philanthropic resources and national trends in foundation and corporate support of higher education.

Giving climate

New Englanders have not performed well in recent widely publicized research on giving. For example, Americans who claimed charitable deductions on their income tax returns in 1994 contributed an average of \$2,325, representing about two-thirds of all charitable giving, according to a recent study of tax data by the Chronicle of Philanthropy. Itemizers in Connecticut claimed \$2,049 on average, ranking 36th among the 50 states and the District of Columbia, while itemizers in Massachusetts claimed an average of \$1,873, ranking 44th — and those are New England's bright lights. Itemizers in New Hampshire, Vermont, Maine and Rhode Island contributed less than \$1,600 on average, ranking 48th to 51st respectively.

An earlier study by the *Chronicle* showed that New Englanders also give less of their relatively high incomes to charity. Nationally, percapita charitable deductions amounted to 1.24 percent of per-capita income in 1992. In New England, per-capita deductions ranged from

1.13 percent in Connecticut to 0.84 percent in Maine. New Hampshire, Rhode Island, Vermont and Maine ranked among the bottom seven states in the country.

While New England accounted for 6 percent of the country's total personal income—and Connecticut and Massachusetts ranked among the top four states in per-capita income—the region's total deducted contributions accounted for barely 5 percent of the U.S. total. In addition, the *Chronicle* in 1994 ranked Boston 28th among the nation's largest 50 metropolitan areas based on selected aspects of charitable giving, even though Greater Boston was fourth in per-capita income.

Weak foundation support

Furthermore, New England's state-supported colleges and universities are stepping up fundraising at a time when U.S. foundations are paying less attention to higher education relative to K-12 education, independent public policy think tanks and environmental organizations. Nationally, foundations directed just 8.8 percent of their grants to higher education in 1994, down from 9.6 percent in 1990, according to the New York City-based Foundation Center.

The foundations' turn away from higher education can hardly be characterized as a full-scale retreat and may not be permanent; nonetheless, foundation funding of certain items such as basic research and faculty development has fallen considerably and is unlikely to rebound anytime soon. These pat-

terns probably hold true for New England foundations as well.

But a more basic problem for New England is its lack of major philanthropic foundations. With 5.1 percent of the U.S. population and 6 percent of U.S. personal income, New England is home to only 4.2 percent of the nation's foundation assets. And of the country's 100 largest foundations, only two are in New England: the Smith Richardson Foundation in Westport, Conn., which ranks 65th, and the Boston Foundation, a community foundation without significant programming in higher education, which ranks 74th.

Corporate retreat

The corporate picture also offers little comfort to new entrants in the private fundraising realm. Corporate giving slid from 2.26 percent of pretax income in 1986 to 1.24 percent in 1995, according to *Giving USA*, the report of the American Association of Fund-Raising Counsel Trust for Philanthropy.

In scaling back their philanthropy, corporations are taking a closer look at where and how they distribute their support. While corporate philanthropy has never lived completely outside a company's business interests, the linkage in today's economic and management climate is much tighter, even to the point where many company giving programs are managed through marketing or public relations departments. The result: fewer and more focused grantee relationships, added emphasis on social services, K-12 education and econom-

A Public Campaign

In October, the University of Massachusetts kicked off its first big league fundraising campaign — an effort aimed at raising \$175 million over five years.

At the Amherst campus, Campaign UMass seeks to raise \$40 million for faculty support, \$40 million for college-based initiatives and research, \$10 million for financial aid, \$30 million for facilities and \$5 million for library acquisitions and technology.

The target for UMass-Boston is \$50 million.

But the UMass goal still doesn't approach those of some more established public fundraisers. The University of Michigan, for example, recently finished raising \$1 billion. Besides, the largest gifts in New England still tend to go to prestigious private institutions. Witness Boston investor Thomas H. Lee's recent \$22 million gift to — where else? — Harvard University.

ic development in communities in which the company has headquarters or operations, and the expectation of a *quid pro quo*, such as endorsements or sponsorship recognition.

In the past decade or so, corporate support for K-12 has increased seven times faster than for higher education, according to Foundation Center data. And universities are finding that corporations are emphasizing partnerships with those institutions whose resources may directly help the company meet a range of goals in hiring, product development and marketing.

For example, in 1995, IBM and DuPont officials told groups of university advancement professionals that their companies had begun increasing their interest in K-12 while emphasizing more focused college and university giving.

Claibourne D. Smith, a DuPont vice president and director of the company's education aid program, told the professionals that DuPont intended to pursue "fewer relationships, but more meaningful ones" with colleges and universities, including "partnerships that are better aligned with today's business needs and where the funding is more closely tied to benefits."

Such trends in corporate giving may be ominous for New England, where the corporate philanthropic presence is relatively weak anyway. Of the nation's largest 200 companies in total sales, only nine are headquartered in New England. And of the nation's top 75 corporate giving programs, just seven are in New England. Only General Electric and GTE rank high in total philanthropic giving.

It would appear then that public colleges and universities in New England eager to grow their private fundraising in the region will sow their campaign seeds in somewhat infertile philanthropic soil.

But the public institutions have found good reason to push ahead. For one thing, New England's public colleges and universities have many excellent programs that can and do compete successfully for grants from those large national funders still interested in higher education. For example, the W.K. Kellogg Foundation recently awarded the University of Vermont \$1.3 million and the University of Maine \$866,000 to support rural development programs. If they attend to these types of opportunities and those presented by local and regional foundations, the region's public institutions will be able to develop the innovative projects that attract foundations.

Secondly, despite New England's loss of manufacturing jobs and the dramatic economic ups and downs of recent years, the region's economy remains vibrant, spawning new companies at a healthy pace, including 14 of the Fortune 100 fastest-growing companies in terms of revenues and income. Indeed, the leaner, more innovative mode in which many local companies are operating may even present new opportunities. For example, companies are now outsourcing research and development, often to academic labs. Such research relationships may lay the groundwork for less restricted giving down the road.

During the next 20 years, today's over-50 age group will pass down to heirs or other beneficiaries as much as \$8 trillion.

But most importantly, the public institutions can develop persuasive cases for support with their alumni, parents and friends, and build strong fundraising programs primarily on that prospect base. The disappointing showing of New Englanders in the studies of charitable giving, while not encouraging for educational fundraisers, does not necessarily indicate a reluctance to support education per se. The private schools have certainly captured their share of New England philanthropy over the years, albeit from what is likely a wealthier segment of the region's population than the public colleges will be approaching.

Because New England's state-supported colleges and universities, perhaps even more than most, date their truly significant growth and maturity only to the years since World War II, their real fundraising potential, as journalist Alan Earls noted in Connection, is just now emerging with the aging of 1950s and 1960s graduates.

The public universities — along with the entire nonprofit world — will also undoubtedly reap benefits from the huge intergenerational transfer of wealth now underway in the United States. During the next 20 years, today's over-50 age group will pass down to heirs or other beneficiaries as much as \$8 trillion, creating at least 5 million new millionaires in the process. The considerable philanthropic energy that this transfer is

almost sure to unleash may power higher education, private and public.

Communitarian culture

Indeed, daunting as it may seem, public universities in New England can find inspiration by looking to the upper Midwestern states of Michigan, Wisconsin and Minnesota, whose flagship state universities rank among the nation's top public higher education institutions in annual voluntary support. The early settlers around the Great Lakes were, after all, predominantly New Englanders or upstate New Yorkers with New England roots. These Yankees brought with them a communitarian spirit rooted in Puritan theology, but given secular expression over two centuries in a strong civic consciousness and an appreciation for the citizen's role in protecting and serving the commonweal.

A responsible citizenry, in turn, must be an educated one. These Midwestern states developed their economies just after the land-grant legislation of the mid-19th century, and without the long regional experience with private schools that continued to dazzle their New England cousins. The upper Midwesterners created public universities that came to dominate the educational landscape and whose graduates would lead the region's social, economic and political structures. They understood how important a role these institutions played in anchoring their region's talent and creativity.

New England may lack state-supported educational systems comparable in their history and regional profile to those of Wisconsin or Minnesota. But the strong respect historically manifested in those states for the role of public schools in a progressive society of educated citizens derives from a communitarian, egalitarian spirit native to our own region. Experts in American regionalism tell us that such fundamental aspects of local cultures, once established in the earliest stages of settlement, are not easily dislodged, even after many generations of development.

The philanthropic soil in New England for public higher education may not be so infertile, after all. Some well-placed turns of the spade are likely to uncover the rich loam of fundraising success.

John C. Schneider is director of corporate and foundation relations and senior adjunct lecturer in history at Tufts University.

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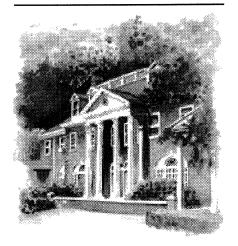
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William M. Bulger on the University of Massachusetts and Economic Development

Observations from the Senate President-turned-University President

uring 35 years in the Massachusetts state Legislature, I had the good fortune to watch a single University of Massachusetts campus blossom into today's five-campus system. While I knew the university was ably discharging its noble mission, I have been pleased to see from my new perspective the extent to which excellence truly does prevail in our classrooms and research labs.

Our students are an inspiration. They scrap and they struggle. Many of them juggle studies, work and family responsibilities throughout the day.

While students are our top priority, the university's role in expanding the state's economy is also compelling. Early this year, we began to take stock of the university's contribution to the state's economy. The story we've uncovered is impressive and exciting.

The University of Massachusetts educates 50,000 students a year. Its graduates stay in Massachusetts, go to work in Massachusetts, buy their homes in Massachusetts, live their lives in Massachusetts and raise their families in the state. About 200,000 Massachusetts residents — one in 30 — hold degrees from the university. One in five Massachusetts residents who hold undergraduate or graduate degrees have a University of Massachusetts degree.

- The University of Massachusetts receives about \$400 million from the state annually, but as a result of grants, federal funds and other factors, the university spends about \$1.5 billion.
- As that \$1.5 billion reverberates around the economy, the university's economic impact rises to \$3.6 billion in annual economic activity and 25,700 jobs. That's a ninefold return on Beacon Hill's investment in the university.
- The university imports dollars into the state \$380 million in out-of-state money in 1995. Of every \$1 the university system received from state appropriations, it generated an additional 95 cents from out of state. The University of Massachusetts Medical Center alone imported \$38 million.

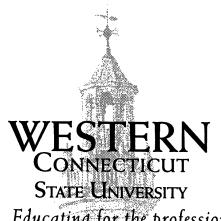
In western Massachusetts, more than three dozen new companies generating 1,000 new jobs have evolved from research conducted at the university's Amherst campus. The University of Massachusetts at Dartmouth, meanwhile, is spearheading an effort to rebuild, if not reinvent, the state's fishing industry. And the University of Massachusetts at Lowell is building a baseball stadium and sports arena that are at the heart of efforts to revitalize that venerable city. The fortunes of the Lowell campus and the city are inextricably bound together, and we are committed to both.

The University of Massachusetts Medical Center is the leading employer in central Massachusetts. The Boston campus helped a Walpole-based water treatment firm grow from fledgling startup to key player in the envirotech industry.

More than a century ago, a Vermont congressman named Justin Morrill and others had an inspired idea: to create a public higher education system that would serve the individual *and* the economy. We must always remain cognizant of this dual aspect of our mission as a land-grant university.

The individual student must not simply be trained for a job — as important an undertaking as that is. He or she must be taught to read critically, to write persuasively and above all to think and be able to make up his or her own mind.

Our students are being trained to join the workforce, but in the long run, they will be all the more valuable to society and to the economy because they have developed that peculiarly human capacity, the ability to think critically.



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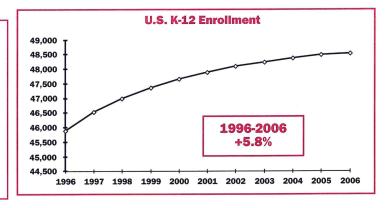
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New England's School-Age Population: Listening for an Echo

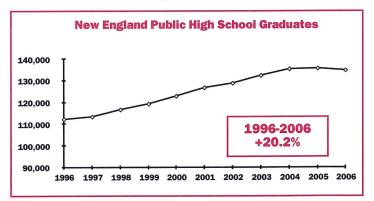
As school started this fall, much was made of the record U.S. K-12 enrollment of 51.7 million, including nearly 46 million students in public schools. Indeed, the U.S. Department of Education projects that the children of baby boomers will continue to cram into America's classrooms — including many temporary classrooms — into the next century. But this so-called "baby boom echo" may be faint in New England. The region's overall K-12 enrollment is projected to drop steadily after the turn of the century, while the nation's keeps rising:

New England K-12 Enrollment			
2,180 T			
2,160			
2,140			
2,120			
2,100	1996-2006		
2,080	-1.8%		
2,060			
2,040 1996 1997	1998 1999 2000 2001 2002 2003 2004 2005 2006		

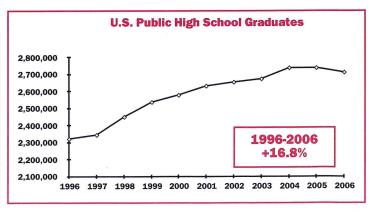
Connecticut Maine Massachusetts New Hampshire Rhode Island	151,000	10-Year Change +1.4% -6.4% -2.0% -2.7% -1.9%
Vermont New England United States	102,000 2,094,000 48,528,000	-3.2% -1.8% +5.8%



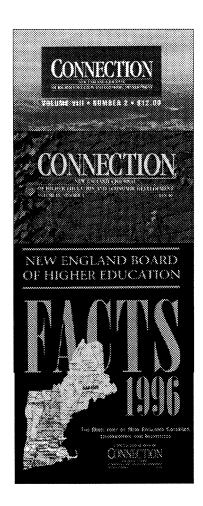
The shrinkage in New England's overall K-12 population by the year 2006 will occur because of smaller and smaller classes entering the early grades. But at the same time, the larger cohort of New Englanders born in the mid-1980s will be working its way into high school. As a result, the number of New England public high school graduates is projected to grow steadily from 112,100 in 1996 to 135,710 in the year 2005, when the number will drop off. In most New England states, the number of high school graduates had declined steadily during the late 1980s and early 1990s.



	ed Public High School raduates in 2006	10-Year Change
Connecticut	33,030	+22.8%
Maine	12,950	+4.9%
Massachusetts	58,810	+22.7%
New Hampshire	13,270	+25.4%
Rhode Island	9,230	+16.5%
Vermont	7,490	+16.5%
New England	134,780	+20.2%
United States	2,710,060	+16.8%



Facts The Directory of New England Colleges, Universities and Institutes



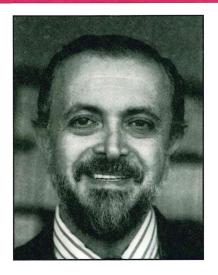
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Nobel Laureate Mario J. Molina on Enjoying Science

The Mexican-born MIT chemist who won the Nobel Prize for his work on ozone depletion offers inspiration to New England minority students

became fascinated with science at an early age, even before entering high school. I remember reading biographies of famous scientists and learning about a mysterious and marvelous world that appeared totally inaccessible to me at that time.

Then I started playing with a chemistry set and a toy microscope. I remember one of my first experiments: I placed some lettuce in water and let it rot for a few days. I then placed a drop of the stinky water under the microscope. Few experiences in life compare with that magic moment! The rotten lettuce was teeming with life, and I was able to observe with my own eyes what those famous scientists had discovered so many years earlier. I have been hooked on science since that time.

Throughout high school, my adventures in science were a bit lonely. My friends thought that science was something for school, not for play or enjoyment. Nevertheless, they tolerated my interest in science.

When I went to college, I discovered a new dimension to my involvement with science — interaction with my fellow students and teachers. There is a myth that science is lonely work — and it can be — but it need not be so in a college or university. Much of the pleasure in learning and discovery comes from discussing science with friends and teachers. The satisfaction of learning something new is amplified by sharing; this becomes another dimension to the joy of doing science.

In graduate school, there was another new experience. I was conducting research on chemical lasers. While monitoring my work, I heard some rather noisy signals. I realized there were patterns to the signals and not just noise. These signals were providing some fundamental information about the behavior of molecules in the laser cavity and I was able to unravel that information. This was a true, original discovery — a relatively modest one, but a new discovery nevertheless. This strongly reinforced my view that contributing to the

expansion of the frontiers of science is fascinating. Scientific research leads to new discoveries and to new ways of understanding how nature works. That is what scientific research is all about.

Of course, doing science requires hard work. At times, there is disappointment and even boredom, but what prevails are those magic moments of creativity and discovery and sharing!

I became a postdoctoral fellow after graduate school, and then a faculty member. And I realized there was yet another dimension to scientific research — that you can contribute to the expansion of the frontiers of science in ways that are beneficial to society. It is extremely rewarding to realize that what you discover can have consequences of benefit to others.

I would like to give you some advice:

Find some area of study that you like, something that you can become really interested in. Explore different topics and activities, such as theory or experiment. There are good examples of very successful people moving from the humanities to the sciences and vice versa. When you're satisfied that you have found what you like, remain focused and try to excel in your work of choice. Be vitally interested and committed to your work. Try to work in teams and share your knowledge. Take advantage of networks.

And above all, don't forget that learning and discovering are extremely enjoyable. Of course, you need patience and perseverance, but in the end, your studies will give you a very rewarding experience indeed.

Mario J. Molina is the Martin Professor of Atmospheric Chemistry at the Massachusetts Institute of Technology.

This article is drawn from Molina's remarks to 350 underrepresented minority students (high school through graduate school) who gathered at MIT in **October for the** fifth annual meeting of **NEBHE's Science** and Engineering **Academic Support Network. Molina** has been a mentor to network students for several years.

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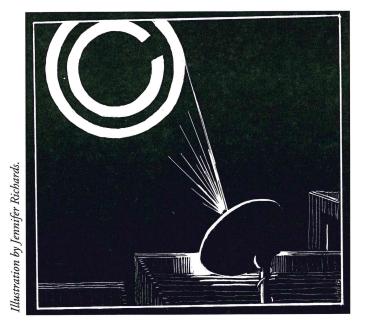
VERMONT

s a New England resident, you may be eligible for significant tuition savings if you study certain programs not available at public colleges in your home state.

Through the New England Regional Student Program (RSP), New England students save thousands of dollars in annual tuition while enrolled in programs not offered by their home-state public colleges and universities. These programs include pharmacy, oceanography, meteorology, law, criminology, marine transportation, engineering, environmental design and many more.

The RSP allows New England students to pay reduced out-of-state tuition at public colleges and universities in the other New England states when they enroll in certain majors not offered at public institutions in their home states. Available programs are listed in the APPLE BOOK — the RSP catalog.

For more information, contact the New England Board of Higher Education, 45 Temple Place, Boston, MA 02111. Phone: 617.357.9620 or 617.338.8RSP. Or view RSP information on the World Wide Web at http://www.nebhe.org.



Copyrights and the Virtual Classroom

JOHN O. HARNEY

s distance learning becomes more widespread, so do sticky copyright issues. Yet the law provides little guidance on how use and misuse of distance learning material may violate copyright laws. And a full year after a White House task force called for redefinition of intellectual property rights in the Information Age, no legislation had been filed to clarify the range of issues raised by the emergence of the virtual classroom.

In the absence of clear answers, most colleges and universities adhere to the same copyright guidelines in distance learning as they follow in a regular classroom. But a simple copyright infringement that may have gone unnoticed in a traditional classroom may be easily detected in distance learning programs, which, by their nature, have more exposure than regular classwork.

In addition, showing a copyrighted picture in a class without permission is not a copyright violation, but transmitting the same image to remote sites using technologies such as satellite or microwave may well be. And if a professor offers a class via distance learning, how can he be sure his lecture notes and class design are not being pirated by someone at a remote location?

The New England Board of Higher Education has sorted out some of these copyright issues as part of its two-year-old Telecommunications and Distance Learning Project, directed by NEBHE Senior Fellow Edmund T. Cranch, the former president of Worcester Polytechnic

Institute. Much of the project's assessment (and a substantial bibliography citing 30 articles and guides on the subject) is contained in a new NEBHE report on copyrights and distance education authored by Molly McCabe, a NEBHE intern and WPI student.

Two aspects of copyright law — "fair use" and "works for hire" — complicate the distance learning issue.

The fair use doctrine allows limited use of copyrighted material, without permission, for certain educational and other nonprofit purposes. Under this doctrine, a faculty member may make copies of most copyrighted material for classroom use, but only under certain conditions. For example: only one copy per student is allowed; the material copied must meet specific guidelines on brevity; the circumstances must make it unreasonable to take the time to seek permission; and unauthorized copying must not substitute for buying the original work.

But technology is challenging the traditional interpretation of fair use. Handing out 200 copies of an arti-

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cle without permission may pass the test for fair use. Distributing 200 copies of a videotape probably wouldn't.

Moreover, "classroom use" historically has been considered fair use under most conditions. But the relatively closed classroom of the old days has given way to interactive distance learning classrooms equipped with monitors as well as multiple cameras: one fixed on the professor, another on students at remote sites, and a third displaying documents, perhaps including copyrighted articles. Fair use? Many copyright owners don't think so. Modern transmission and audio-video technologies open up the classroom to anyone who can view or record the electronic signal. Copyright owners are pressing for national legislation to tighten up the fair use doctrine.

In contrast, the works for hire doctrine guides ownership of copyrighted material. Courts have tended to rule that a work was made "for hire" if, among other conditions, the employer had considerable control over the work's content. Colleges and universities usually have little input into the content of faculty works, however, and indeed until 1976, college professors automatically were given copyright to the work they produced.

Even today, "most work created by faculty in a scholarly setting generally belongs to the author," the report says. But technology raises the stakes. "Traditional classroom material normally has very little direct economic value," the report notes, "whereas a CD-ROM or the equivalent might possibly have significant economic value, and thus the university could attempt to claim ownership." The report urges colleges and faculty members to reach agreements concerning creation, for example, of CD-ROMs and other new media.

Linking learners

The copyright questions are growing in importance as distance education is heating up all over the United States. An estimated 7 million Americans are taking part in some form of distance learning.

The Western Governors' Association has announced plans to launch a "Virtual University," as the Western states grapple with tight finances and a surge in college-bound students.

In New England, the states of Maine, New

Justice On-Line

The information society and the litigious society are colliding on-line. As more people and institutions roam cyberspace, new legal disputes are arising over issues such as e-mail list-selling, copyright infringement and on-line harassment.

In June, two legal studies professors at the University of Massachusetts at Amherst launched a new on-line service designed to mediate Internet disputes before the parties involved file lawsuits. Ethan Katsh and Janet Rifkin were awarded \$50,000 by the National Center for Automated Information Research to create the Online Ombuds Office on the Internet. Address: http://www.ombuds.org.

Wiring Rhode Island

Rhode Island voters recently approved a four-year, \$40.6 million initiative to upgrade telecommunications technology at the state's three public institutions.

The first phase of the project calls for nearly \$22 million worth of infrastructure improvements, including cabling 114 public higher education buildings, to accommodate new technologies. A second phase includes the installation of network systems, voice and video equipment and more than 3,000 workstations.

In 1995, a committee of Rhode Island telecommunications experts assembled by the state Board of Governors for Higher Education found the Rhode Island public system of higher education "woefully ill-equipped and underfunded to meet the telecommunications and computer networking needs of its students, faculty and staff, and the public."

Hampshire and Vermont boast well-established distance learning networks. More recently, Massachusetts has begun building a statewide fiber-optic backbone through the Massachusetts Information Turnpike initiative, which will link the five campuses of the University of Massachusetts to one another and regional networks.

Connecticut's Department of Higher Education has completed a feasibility study to create a statewide technology network. And voters in Rhode Island approved more than \$40 million in bonds this fall to create fiber-optic links at the University of Rhode Island, Rhode Island College and the Community College of Rhode Island.

In addition to statewide efforts, a growing number of New England colleges and universities have begun delivering distance learning programs to special audiences ranging from schoolchildren to working engineers and other nontraditional "lifelong learners."

With support from the AT&T and Culpeper foundations, NEBHE's Telecommunications and Distance Learning Project is investigating a range of distance education issues such as accreditation and cost-effectiveness.

"Clarifying copyright and intellectual property matters is crucial to addressing some of the other key questions raised by educational technology," says Cranch. "The challenge is to ensure that legislation aimed at protecting owners of intellectual property does not further limit educational use of copyrighted material, thereby compromising distance learning's promise of expanded access to education."

John O. Harney is editor of CONNECTION.

KINGSTON, R.I. — The University of Rhode Island was awarded \$196,750 by the Rhode Island Department of **Environmental Management to** electronically map six square miles around Greenwich Bay, creating digital images showing land use, vegetation, septic system patterns and boundary lines. The collaborative project with the city of Warwick aims to help restore water quality in the bay, where pollution has forced the closing of once-rich shellfish beds.

BAR HARBOR, MAINE -A

College of the Atlantic partnership was awarded \$20,600 by the federal Institute of Museum Services and \$10,000 by the NYNEX Foundation to fund a collaborative program in which fifth-grade students from Maine's Mount Desert and Pemetic elementary schools will develop a World Wide Web site that highlights the rich historical, cultural and natural landscapes of Mount Desert Island.

PROVIDENCE, R.I. —

Rhode Island College received \$48,000 from the Rhode Island Office of Higher Education to teach students from Providence and Scituate, R.I., about the Scituate Reservoir. Under the program, RIC faculty will offer teachers from the two communities staff development programs in science and information technology.

JOHNSON, VT. — Johnson State College received a three-year, \$590,000 grant from an anonymous donor to strengthen its degree program in hotel and hospitality management. The grant will allow the college to add faculty, develop new internship programs, offer \$150,000 in scholarships, create a state-of-the-art technology lab and develop training workshops for hotels, inns and restaurants.

DURHAM, N.H. — Two University of New Hampshire education professors were awarded a two-year \$296,000 grant by the Spencer Foundation of Chicago to study a northern Italian town known for its early childhood education program. Professors Rebecca New and Bruce Mallory will establish a research team in Reggio Emilia to study home-school relations in the town, where approximately 12 percent of the budget supports a municipal child care program for children ages 6 months to 6 years.

N. DARTMOUTH, MASS. —

The University of
Massachusetts at Dartmouth
was awarded \$575,000 by the
Luso-American Foundation of
Lisbon to support the
university's Center for
Portuguese Studies and Culture
through the year 2000. The
funds will be used to outfit the
center, hire faculty, conduct
programs, perform research

and establish a master's degree program in Portuguese language.

CAMBRIDGE, MASS. —

Harvard University launched a major effort to encourage environmental research that can be used by policymakers. Funded by a five-year, \$1.9 million grant from the National Science Foundation, the initiative will support research on issues such as global warming and use monographs and seminars to bring the results to the attention of policymakers. The program will be based at Harvard's Kennedy School of Government and involve faculty from Harvard as well as Carnegie-Mellon, Cornell and Duke universities, and the International Institute for Applied Systems Analysis in Austria.

WEST HAVEN, CONN. —

Three University of New Haven engineering professors were awarded \$100,000 by the Connecticut Department of Economic Development to provide technical expertise to the Newton-New Haven Die Casting Co. The grant, made under the state's Yankee Ingenuity Initiative, may be renewed after the first year.

AMHERST, MASS. — The University of Massachusetts at Amherst created the Leonard Horwitz Professorship in Latin American Politics and Studies, named for the late alumnus and foreign service officer who

donated \$700,000 to endow the position. Howard Wiarda of the UMass political science department was named the first Horwitz professor.

DURHAM, N.H. — A

University of New Hampshire satellite project was awarded \$4 million in NASA funds from the Universities Space Research Association. In cooperation with Weber State University in Utah and England's University of Leicester, UNH researchers and students will develop the 275-pound Cooperative Astrophysics and Technology Satellite (CATSAT) to study the mysteries of gamma rays and X-ray bursts that produce random, violent explosions in the universe. UNH will develop the satellite's scientific payload, and a receiving station at UNH will collect data from the satellite, which will be built and operated by Weber State.

PUTNEY, VT. — Landmark College received \$1.5 million from Charles and Nan Strauch of California toward creation of a new student center on the campus quadrangle. Charles Strauch is chairman and CEO of PairGain Technologies and chairman of the Landmark board of trustees.

KINGSTON, R.I. —

University of Rhode Island College of Pharmacy alum Ernest Mario donated \$1.5 million to the college to establish an endowed chair in pharmaceutics. Mario is the chief executive officer of Alza Corp., a California developer and manufacturer of therapeutic drug delivery systems.

NASHUA, N.H. — Rivier
College introduced a master of
business administration
program in health care
administration to provide
managerial training for
professionals working in
health care.

WARWICK, R.I. — New England Institute of Technology unveiled an 18-month associate degree

program in data and voice communication technology. The program trains students to install, service and maintain equipment integrating voice, sound, video and computer data. The institute also introduced a new associate degree program in computerized business management technology, built on a combination of business and computer courses.

STORRS, CONN. — The University of Connecticut received \$2 million from the U.S. Economic Development Administration to build a facility to house the university's Precision Manufacturing Center, including space for

startup manufacturing businesses. UConn officials say the facility will permit more transfer of manufacturing technologies and spinoff business activity.

partnership led by the
University of Massachusetts
at Lowell's Center for Family,
Work and Community was
awarded a four-year, \$600,000
grant by the National Institute
of Environmental Health
Sciences to develop an
environmental health
communication plan for the
city. UMass scientists, local
health care providers and
leaders of Lowell's 25,000member Southeast Asian

community will use computerized geographic information systems and other strategies to identify and respond to environmental and occupational health risks in the city.

KINGSTON, R.I. — The University of Rhode Island formed a partnership with the Rhode Island departments of Public Health and Environmental Management and Lifespan/Miriam Hospitals to respond to outbreaks of infectious diseases. The Rhode Island Public Health Partnership in Infectious Disease Control focuses on: enhancing surveillance of diseases, including working

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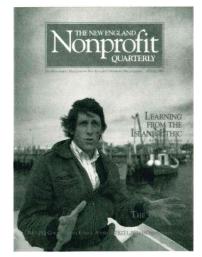
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with hospitals to track resistance to antibiotics; improving diagnostic capabilities; studying host and pathogen interactions; and launching prevention strategies, including developing disease prevention curricula for elementary and middle schools.

BOSTON, MASS. — The Boston University/Chelsea **Public Schools Partnership** was awarded a three-year, \$2 million grant by the Annenberg Foundation. The grant will support the partnership's staff development initiative, a new curriculum project in the arts and the "Intergenerational Literacy Program," in which adults learn literacy skills along with their children. BU began managing the Chelsea, Mass., schools in 1989 as part of a 10-year education reform initiative.

MANCHESTER, N.H. —

Notre Dame College was awarded \$10,000 from NYNEX to implement a "Partners for Success" initiative aimed at increasing the skills and aspirations of young people in northern New Hampshire. Under the program, fifth- and sixthgrade students at Conway Elementary School are matched with Notre Dame student "buddies" and local senior citizen mentors to develop solutions to school or community problems. The students hone their communications and

computer skills as they research and implement solutions to "real-life" problems.

AMHERST, MASS. — Two University of Massachusetts at Amherst engineering professors were awarded a three-year grant worth more than \$398,000 from the National Science Foundation to integrate research on "intelligent transportation systems" into graduate and upper-level undergraduate engineering curricula.

GREAT BARRINGTON,

MASS. — Overseers of Simon's Rock College of Bard approved construction of a \$3.7 million science and academic center, including laboratories, multimedia and computer facilities, offices and classrooms. The 16,000 square-foot building, slated to open in fall 1997, represents the largest construction project since the college's main campus was built in the late 1960s.

PROVIDENCE, R.I. —

Rhode Island College received \$1 million from the Rhode
Island-based Feinstein
Foundation to provide a
permanent endowment at the
college's School of Education
and Human Development.
College officials said the
proceeds from the endowment
will be used to support faculty
development, research, travel
and other unmet needs and
apply the foundation's

emphasis on public and community service to the school's curriculum.

DURHAM, N.H. —The University of New Hampshire was awarded \$850,000 under the U.S. Department of Education's Ronald E. McNair Post-Baccalaureate Achievement Program to help minority, low-income and firstgeneration college students prepare for Ph.D. programs. UNH was one of 90 institutions nationwide to win funding under the program named for the late Challenger astronaut. McNair Fellows take part in a summer residential research experience at the Durham campus, internships and other programs aimed at preparing them for graduate school.

KINGSTON, R.I. — The University of Rhode Island received \$1 million from the Rhode Island-based Feinstein Foundation to provide scholarship assistance to undergraduate students at **URI's College of Continuing** Education in Providence and financial assistance to help their children enroll in a new child development center at the college. The majority of students at the College of Continuing Education are adult women.

AMHERST, MASS. — The University of Massachusetts at Amherst Translation Center was awarded \$72,000 by the administrative offices of the Massachusetts Trial Court for

the first year of a three-year program to develop training for court interpreters and to teach court-specific Spanish lessons to court employees from judges and bailiffs to prosecutors and police officers.

storrs, conn. — A team of University of Connecticut and Raytheon Co. scientists was awarded a \$1.4 million grant from the Office of Naval Research to create a smaller, lighter and more accurate radar system. Researchers at UConn's microelectronics-optoelectronics laboratory received a three-year, \$510,000 subcontract from Raytheon for work on the "optically controlled phased array radar."

LOWELL, MASS. — The University of Massachusetts at Lowell's Center for Advanced Materials was awarded a five-year, \$2.7 million grant by the Office of Naval Research to work with area companies in developing optical materials that could be used in upgrading older Navy ships and aircraft.

RANDOLPH CENTER, VT. —

Vermont Technical College was awarded \$10,000 by the NYNEX Foundation to help teach a laboratory-based course in electrical and electronics engineering technology to students at an off-campus location relying on simulation software and the Internet instead of the

traditional on-campus laboratory. The course will be offered as part of VTC's Vermont Academy of Science and Technology, enabling students to earn first-year college credit while they complete high school graduation requirements.

BIDDEFORD, MAINE —

The University of New England reached agreement with Northeast Marine Animal Lifeline and Boston's New England Aquarium to create the region's first university-based marine animal rescue and rehabilitation center. The university agreed to provide land for a state-of-the-art facility to rescue and

rehabilitate sick and injured dolphins, whales, seals and turtles stranded along the northern New England coast. Currently, the New England Aquarium in Boston is the closest facility for rehabilitating marine mammals along Maine's coast.

BOSTON, MASS. —

Emmanuel College announced it would offer two master's degree programs at Cape Cod Community College in Barnstable, Mass., starting in January 1997. Emmanuel will offer a master's in health services administration and a master's in management, both in an accelerated format geared to working adults.

WALTHAM, MASS. —

Bentley College introduced a post-baccalaureate certificate program in banking and financial services. The fourmonth program, developed by Bentley and the New England Banking Institute, consists of seven two-day sessions and addresses topics ranging from leadership and team building to risk management.

WATERVILLE, MAINE —

Thomas College began offering Maine's first master's degree program in taxation at its new Center for Lifelong Learning in Portland. Thomas expects to offer other associate, bachelor's and master's programs at the Portland site.

WARWICK, R.I. — The Community College of Rhode Island established a Center for Entrepreneurship Training and Development at its Lincoln, R.I., campus. The center received a two-year, \$45,000 grant from the Kauffman Foundation to provide entrepreneurial skills training to welfare recipients, and \$24,000 from the Rhode Island Human Resource **Investment Council to promote** entrepreneurship as a career pathway in the state's schoolto-work system.

W. HARTFORD, CONN. —
Saint Joseph College was
awarded \$174,652 by the
National Science Foundation to



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create a research and training facility for faculty and undergraduates majoring in biology, chemistry and environmental science. The facility will occupy renovated lab space in the college's 60-year-old McDonough Hall. Saint Joseph officials say bringing together all natural science students and faculty in one facility will enhance interdisciplinary research.

DURHAM, N.H. — The University of New Hampshire announced it would receive \$14.2 million in federal appropriations to address land-based contamination of coastal waters and related environmental problems. The bulk of the appropriations, jointly announced by UNH and U.S. Sen. Judd Gregg of New Hampshire, will support a new **Estuarine Environmental** Technology program at UNH, which will serve as a national test site for technologies designed to monitor and prevent contamination of coastal waters, and fund a state-of-the-art Environmental Technology Building.

FALL RIVER, MASS. —

Bristol Community College was awarded \$448,040 in
Performance Improvement
Program grants from the
Massachusetts Board of Higher
Education to create electronic
distance learning networks
and implement an interactive
student information system.
The distance learning project,
a collaborative effort among

Bristol and Cape Cod Community Colleges, the University of Massachusetts Dartmouth, Texas Instruments, Attleboro High School and the **Greater New Bedford Regional** Vocational Technical High School, will create a videolinked network of classrooms allowing students at different sites to work together. The registration system will allow students, many of whom work during the day, to take care of school business around the clock and alert faculty and staff to student academic problems.

BURLINGTON, VT. —

Champlain College was awarded a challenge grant of \$100,000 from the Vermont Country Store toward construction of a multimillion-dollar Information Commons, the college's proposed high-technology center. The Manchester Center, Vt., retail and direct-mail company pledged to match dollar for dollar any additional support provided by Vermont businesses.

LONGMEADOW, MASS. —

Bay Path College received \$125,000 from the Davis Educational Foundation of Massachusetts to establish a campuswide fiber-optic network.

WILLIMANTIC, CONN. —

Eastern Connecticut State University received \$100,000 from the Davis Educational Foundation of Massachusetts to equip a high-tech classroom in which students will study computer graphics, desktop publishing, imaging, journalism, video editing and music production. University officials plan to make the special multidisciplinary programs available to students at local community colleges and secondary schools.

GARDNER, MASS. —

Mount Wachusett Community College received four grants totaling \$263,500 for a variety of technology upgrades. The college was awarded \$150,000 by the Massachusetts Board of Education to equip a state-ofthe-art multimedia production facility for its broadcasting and telecommunications program, and \$10,000 from NYNEX to investigate development of a broadcasting and telecommunications distance education course. The college also was awarded \$60,500 by the Helene Fuld Health Trust to design a high-tech classroom and lab, and \$43,000 from the National Science Foundation to buy state-of-the-art interactive computers and software for a multimedia-oriented anatomy and physiology lab.

MANCHESTER, N.H. —

New Hampshire College received \$10,000 from the Samuel P. Hunt Foundation of Manchester to purchase equipment for the culinary arts laboratories in the college's new 30,000 square-foot hospitality building. The facility, one of three new buildings on the campus, will

house the college's programs in hotel and restaurant management, culinary arts and travel and tourism.

BOSTON, MASS. — Boston University's School of Medicine was awarded a five-year, \$3.1 million grant from the National Institute on Aging to conduct and promote research into Alzheimer's disease. Researchers plan to study two distinct groups of Alzheimer's patients: one comprised mostly of suburban men based at the **Bedford Veterans Medical** Center, and the other, drawn from the ethnically diverse, poor urban population served by the Boston Medical Center's geriatrics section.

MIDDLEBURY, VT. -

Middlebury College received an unrestricted \$5 million gift from investor Louis Marx Jr., a trustee and father of two Middlebury graduates. College officials said they would use the gift to support the proposed Bicentennial Hall, which will house Middlebury science programs and summer language schools.

BOSTON, MASS. —

Emerson College introduced a weekend certificate program in World Wide Web home page production and management. The 10-week program aims to teach students how to design, implement and manage a site on the fast-growing World Wide Web.

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