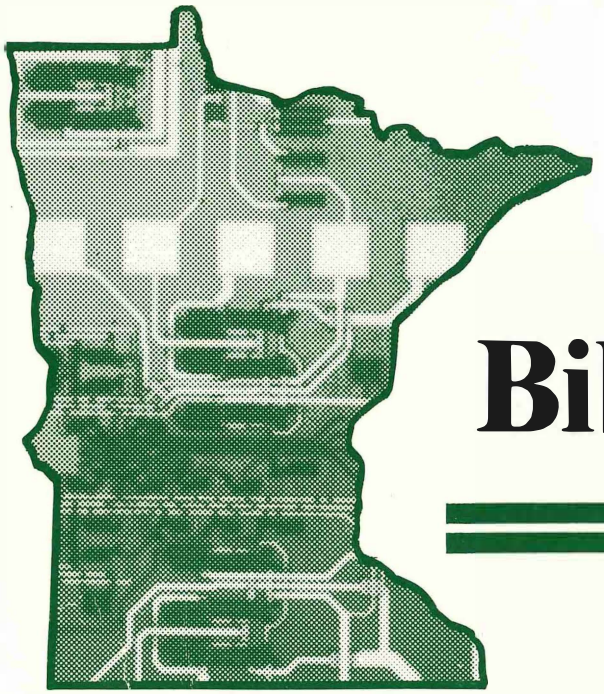
Minnesota's High Technology Industry Its Impact: Now and in the Future

January 14-15, 1985



Bibliography

INTRODUCTION

For those interested in exploring more fully the issues discussed at the conference, the Legislative Reference Library has developed this bibliography of current literature on the high technology industry. This bibliography is divided into three topical areas: education, employment, and foreign trade. These lines of distinction are not exact and there are citations of general interest in each of the sections.

These materials may be obtained by legislators and staffs through the Legislative Reference Library. Others should contact the James J. Hill Reference Library.

December, 1984

HIGH TECHNOLOGY AND EDUCATION

Making a University/Industry Match
Anonymous
Chemical Week v134n7 PP: 20,24 Feb 15, 1984 CODEN: CHWKA9 ISSN: 0009-272X JRNL CODE: CEM
DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 2 Pages
AVAILABILITY: ABI/INFORM
Technology Transfer Conferences (TTC) of Nashville, Tennessee, is a nonprofit group that sets up regional conferences on technology transfers. TTC uses a host university, invites about 10 other nearby universities to participate, and then invites up to 30 companies to take part. Brief general presentations by the university representatives begin the conferences. University representatives next offer a 20-minute summary of their schools' applied research activities. One-on-one discussions between industry and university representatives follow. TTC's approach has been called innovative as well as imitative. According to Vladimir Dvorkovitz, president of Dr. Dvorkovitz & Associates, a technology transfer firm in Ormond Beach, Florida, the TTC approach is a repeat of what his company was doing 12 years ago. However, representatives of both Dow Chemical and Monsanto think highly of the TTC conferences.

Research for Sale
Gibson, G. Thomas
Venture v6n3 PP: 78-86 Mar 1984 CODEN: VENTDC ISSN: 0191-3530 JRNL CODE: VEN
DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 4 Pages
AVAILABILITY: ABI/INFORM
Many universities are planning to fund, develop, and commercialize their research and development (R&D) efforts by creating technology-transfer organizations. Through these units, the universities hope to impose new discipline on the company formation process. By 1985, 30-40 of the leading universities and research institutions in the US may have such units. Each will be backed with $5 million-$25 million in R&D partnership money. The money backing these units will be used by the universities to identify the most promising technologies and develop ideas to the prototype stage. Baylor University and the University of Pittsburgh are 2 of the colleges interested in such projects. Commercialization of R&D efforts is increasingly becoming a necessary source of revenues. However, some are concerned that commercialization efforts will hinder the free flow of information; this is the reason Harvard University refuses even to take equity in university startups.

Technology Transfer Urged
Cu-Uy-Gam, Miriam
Computing Canada (Canada) v9n21 PP: 7 Oct 13, 1983 ISSN: 0319-0161 JRNL CODE: CCD
DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 1 Pages
Panelists at a recent session of the International Electrical, Electronics Conference and Exposition affirmed that cooperation among government, industry, and university sectors is mandatory to effective technology transfer of technological knowledge and expertise from the laboratory to the applications arena. Nationalistic zeal should not be allowed to obscure the benefits of such transfer on an international scale. Contract research and development (R&D) between university and industry provides a channel for direct technology transfer through which both sectors will benefit, according to Gordon Slemon of the University of Toronto. Among the firms strengthening ties with academia is Spar Aerospace Ltd., through grants and other activities. Cooperation between the company and the University of Toronto solved a problem with the Anik D satellite. Canadian General Electric Co. Ltd. also supports international technology transfer and notes the wholesale technology transfer that has taken place from Western nations to Japan.

Helping the Schools Get Back to Work
Wantuck, Mary-Margaret
Nation's Business v71n9 PP: 30-32 Sep 1983 CODEN: NBUSAY ISSN: 0028-047X JRNL CODE: NAB
DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 3 Pages
AVAILABILITY: ABI/INFORM
US schools have become dangerously deficient, and they are not prepared to train the 15 million new workers that will enter the workforce in the coming decade. To make up the deficiency, business must become heavily involved in improving the quality of education. Some companies already are meeting the challenge. For example, International Business Machines (IBM) has donated $40 million worth of computer systems to the engineering schools of 20 universities. Another response is the Adopt-a-School program, wherein companies and private-sector institutions provide personnel and resources to elementary and high schools. Through A Better Chance Inc. sends top juniors in public and private high schools to 4-week summer programs at 7 university business schools. Massachusetts has established the Bay State Skills Corp. to bring businesses and schools into partnerships to train people with inadequate or obsolete skills. Partnerships between colleges and industry seek to pool talents and resources to accomplish what neither can do alone.

Business and Universities: A New Partnership/Corporations Bet on Campus R&D
Anonymous
Business Week n2770(Industrial Edition) PP: 58-62 Dec 20, 1982 CODEN: BUWEA3 ISSN: 0007-7135 JRNL CODE: BWE
DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 5 Pages
(cont. next page)

AVAILABILITY: ABI/INFORM

The partnership between businesses and universities is aimed at stimulating US innovation and productivity. Businesses are spending more money to help universities, and they are also lending experts to teach courses and shape the education of students they will eventually hire. In return, colleges are tailoring services specifically for business and are actively soliciting research funds. While there are certain problems associated with this relationship, the potential gains are worth the risks. More and more corporations are funneling research and development (R&D) money to colleges. An estimated $275 million is expected to be given this year. Companies and universities need each other now more than ever in this era of fast-paced technological change. Relaxed federal guidelines are also making it easier for business and colleges to work together in research. Competition is becoming fierce for corporate funds because many schools will not survive without the financial assistance. Graph.

Technology Transfer at Issue: The Academic Viewpoint

Gray, Paul E.

IEEE Spectrum v19n5 PP: 64-68 May 1982 CODEN: IEESAM ISSN: 0018-9235 JRNL CODE: SPC

DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 5 Pages

AVAILABILITY: ABI/INFORM

The growing concern in the federal government that the ''leaking'' of technical material and ideas to other countries impairs national security has caused the US to take a new and vigorous interest in controlling the flow of technology outside its borders. However, specific efforts taken to control technology transfer in the university setting are themselves likely to weaken the US position, and thus do not serve the national interest. This is so because such constraints on research will discourage many faculties from undertaking that research. The quality and integrity of research are anchored in its nature as a dispersed, interdependent, and cumulative effort which is dependent on the free flow of information to thrive. The question of technology transfer has been addressed by 5 university presidents heavily involved in research in a letter to the secretaries of commerce, defense, and state. Admiral Bobby Inman of the Central Intelligence Agency proposed a system of voluntary prior review in such fields as: 1. computer hardware and software, 2. lasers, 3. electronic equipment, 4. crop production, and 5. manufacturing procedures. An alternative approach to Inman's proposals would draw a much narrower list of areas to be protected. References.

A Study of University/Small Business Interaction for Technology Transfer

Dean, Charles W.

Technovation (Netherlands) v1n2 PP: 109-123 Aug 1981 ISSN: 0166-4972 JRNL CODE: TCH

DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 15 Pages

AVAILABILITY: ABI/INFORM

This research attempted to find effective methods of stimulating technology transfer between academic institutions and small businesses. A major thrust involved finding ways to reduce existing barriers to useful interaction between the 2 groups. Several hundred small businesses in the Western Pennsylvania region were contacted, via questionnaire and letter. Through visits to some businesses, problem areas were identified and then transmitted to appropriate resources. Originally, Carnegie-Mellon University was the prime resource, but later, other universities were invited and agreed to participate. One of the major results was the finding that great differences exist between small-business and academic personnel in perception of problem importance, time required to solve problems, and appropriateness of cost factors. Such differences dampened initial enthusiasm and interfered with the development of effective working relationships. Improved communication and cooperation between small business and academic technological resources are only likely to happen through the re-education of pertinent attitudes and perceptions. References.

Acquiring and Marketing Technology-Industrial Research Institute Position Statement on Licensing of Technology

Research Mgmt v22n3 PP: 32-33 May 1979 CODEN: RESMA3 ISSN: 0034-5334 JRNL CODE: RMG

DOC TYPE: Journal Paper LANGUAGE: English

AVAILABILITY: ABI/INFORM

Transferring technology between countries or corporations and from universities and private individuals to commercial enterprises is affected by the licensing of patents and know-how. The government influences this flow of technology through patent laws, antitrust actions, research by government employees, and government-funded research in universities and contract laboratories. In order to promote technology transfer, privately-owned patents should not be subject to compulsory licensing. The government should grant exclusive licenses to government-owned patents, and the no-royalty, no-fee basis for the granting of non-exclusive licenses to government patents should be discontinued. Innovative efforts of private inventors should be supported, and the inventions originating at the university level should remain the property of the university. These recommendations are based on the studies made by the Industrial Research Institute in 1978.

FORUM SEEKS TO AID TECHNOLOGY TRANSFER

Chemical & Engineering News V52 N6 PP: 20-21 FEB 11, 1974 CODEN: CENEAR ISSN: 0009-2347 JRNL CODE: CEN

DOC TYPE: Journal Paper LANGUAGE: English

THE IDEA OF THE FORUMS IS TO PROVIDE A COMMON MEETING GROUND

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FOR INDUSTRY AND UNIVERSITIES TO EXPLORE WHAT IS NEEDED AND WHAT IS AVAILABLE. THE MAIN ATTRACTION AT THE FORUMS IS AN ARRAY OF PRESENTATIONS BY UNIVERSITY REPRESENTATIVES ON THE NEW TECHNOLOGICAL DEVELOPMENTS MADE IN UNIVERSITY RESEARCH PROJECTS. BEYOND THESE PRESENTATIONS, THERE ARE ALSO SYMPOSIUMS THAT CENTER ON THE UNIVERSITY-INDUSTRY INTERFACE. ALTHOUGH THE NEW TECHNOLOGY PRESENTED BY THE UNIVERSITIES SPANS A WIDE VARIETY OF FIELDS - A PROTOTYPE OF A TYPEWRITER FOR THE BLIND IS ONE DEVELOPMENT, FOR EXAMPLE - MUCH OF IT IS CHEMICAL. CHEMICALLY RELATED DEVELOPMENTS OFFERED AT THE FORUM RANGE FROM CATALYTIC SYSTEMS AND SYNTHESES TO ORE TREATMENT AND ANALYTICAL INSTRUMENT DEVICES.

Rediscovering Technology
Paul, Ronald S.
Management World v13n2 PP: 1,6 Feb 1984 ISSN: 0090-3825 JRNL CODE: MWL
DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 2 Pages
AVAILABILITY: ABI/INFORM

Though the US and Canada have unsurpassed technology, they have both lagged in introducing this technology into products and production. There are some indications that this lag is beginning to be addressed, most notably by industry's renewed commitment to technology as the crucial factor for improved productivity, profitability, and competitiveness. High-technology industries' greatest contribution to economic growth will come from the secondary impacts of their output. Industries using the output of high technology in their products and in producing their products will grow. New and more productive partnerships must be developed, involving industry, government, and academicians, to speed up development and implementation of new technologies. Private industry can play a significant role in academic education by donating equipment, by encouraging technical personnel to take part-time faculty roles, and through direct financial support.

Skill Shortages Threaten Technological Prowess
Anonymous
Futurist v18n1 PP: 79-80 Feb 1984 CODEN: FUTUAC ISSN: 0016-3317 JRNL CODE: FUS
DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 2 Pages
AVAILABILITY: ABI/INFORM

The US faces growing shortages of computer-literate workers and qualified mathematics and science teachers. This situation will lead to a shortage of workers in the high-technology industries and may even portend the decline of the US as world science/technology leader. Although the demand for skilled workers seems quite clear, the supply of graduates cannot meet it because of the limited computer education programs available. Between 1971 and 1980, there was a 77% decline in those prepared to teach math in secondary schools, and a 65% decline in those prepared to teach science. Lack of funds is a primary reason for the dearth of computer education programs. In addition, tight public school budgets do not permit purchase of a sufficient number of microcomputers for classrooms. Remedies for the technical education shortage include more cooperation from industry in providing needed equipment, experimentation with televised computer education, and retraining of surplus teachers who are now in other fields.

A Business and Business Education Partnership
Downer, Joseph P.
Business Forum v8n4 PP: 21-23 Fall 1983 ISSN: 0733-2408 JRNL CODE: LAB
DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 3 Pages
AVAILABILITY: ABI/INFORM

Businesses must develop closer relationships with the business educator and the student to acquire young people who are well-grounded in fundamentals and who have growth potential. There is a new quality of urgency underlying the effort to improve ties between business schools and the business community. That urgency arises from the need to analyze and solve some of the most severe challenges the US business community has ever faced. A number of forces, including fierce competition, advances in high technology, and a shift from industrial to information work, is making the management of a business organization an extremely complex activity. Business needs people who are entrepreneurial, who seek effectiveness and efficiency, who can concentrate on what to do and how to do it, and who search for new and better ways of doing things. The business community and business education can help meet the needs of today and the future through such strategies as using business students as interns or employees.

The Low-Skill Future of High Tech
Levin, Henry; Rumberger, Russell
Technology Review v86n6 PP: 18-21 Aug/Sep 1983 CODEN: TEREAU ISSN: 0040-1692 JRNL CODE: TCR
DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 4 Pages
AVAILABILITY: ABI/INFORM

Policymakers are responding to high technology by proposing to upgrade mathematics and science education at all levels and to put more computers into classrooms. Proposed changes are based on the assumptions that future job growth in the US will move toward professional jobs that require significant computer-related training and that high technology requires upgraded skills because workers will be using new technical tools. These assumptions are wrong. Increases in the lowest skilled jobs will greatly outpace the growth of high-technology jobs. The growth of high-tech industries and their products will more likely lower the skill requirements of US workers than increase them. Greater emphasis now should be placed on a strong, general education, rather than a narrow, specialized one. A comparison of US Department of Labor information on job-skill training requirements for specific occupations in 1960 and 1976 indicates that, despite continuing advances in technology and a broad shift toward automation, job-skill requirements have changed very little. Graphs. References.

A Business School Dean Manages Change and 'Herds the Cats'
Anonymous
International Mgmt (UK) v38n8(European Edition) PP: 25-26 Aug 1983 CODEN: ITMGAT ISSN: 0020-7888 JRNL CODE: IMG
DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 2 Pages
AVAILABILITY: ABI/INFORM

Robert K. Jaedicke, the new dean of California's Stanford Graduate School of Business, likens his job to running a high-technology company, with students being the product he delivers. Jaedicke plans to give academics a sense of direction by teaching more sophisticated skills and offering up-to-date courses. The important issues in management today he defines as: 1. the international dimension, 2. the changing business environment, 3. productivity, and 4. entrepreneurship. As associate dean for academic affairs at Stanford from 1969 to 1981, Jaedicke played a key role in revamping and broadening the curriculum to include courses in manufacturing, relations with the public sector, and international management. Jaedicke considers it important to maintain a balance of faculty attention between professional programs and the freedom to pursue research. Stanford's faculty is organized by groupings of people in similar disciplines, rather than by departments, which emphasizes program orientation.

An Introduction to High Tech/Prospects for High Tech in Illinois
Schnell, John F.; Junkus, Joan C.
Illinois Business Review v40n3 PP: 6-9,12 Jun 1983 CODEN: ILBRAJ ISSN: 0019-1922 JRNL CODE: ILB
DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 5 Pages
AVAILABILITY: ABI/INFORM

The varying perceptions of high technology warrant a closer examination of what this phenomenon is and is not. There is little concurrence on the definition of a high-tech industry. The US Bureau of Labor Statistics bases its classification of these industries on higher than average research and development expenditures and numbers of technical employees. High-tech firms include manufacturers of drugs, computers, and electronic components. Although the high-tech sector will produce new jobs, growth in employment will not equal growth in production. There is doubt about whether the US will produce enough technically trained workers. Substantial federal support of training programs appears unlikely in the near future. Illinois has the potential to become a leader in the new high-tech industries, with its large population, established infrastructure, several major universities, and a number of local economic development agencies that are aware of the importance of attracting a new type of industry to the state. Graphs. Tables.

National Education: Trade Schools Go High Tech
Anonymous
Business Week n2797(Industrial Edition) PP: 85-86 Jul 4, 1983 CODEN: BUWEA3 ISSN: 0007-7135 JRNL CODE: BWE
DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 2 Pages
AVAILABILITY: ABI/INFORM

The sagging economy, with its concurrent high unemployment and resulting demahd for new job skills, has meant good news for the vocational training industry. The industry's leader is the National Education Corp. (NEC). NEC (Newport Beach, California) runs 49 schools with a total enrollment of about 35,000 students. From 1978, NEC's revenues increased about 400% to $135 million in 1982. However, NEC made only $5.5 million in 1982, so president and chief executive officer H. David Bright has developed a new strategy that stresses consolidation. NEC plans to create a nationwide network of vocational colleges that offer training in computers, electronics, and the expanding technologies, all with a good promise of jobs for graduates. The first such super school, with more than 1,000 students, will open soon in West Los Angeles, California. Bright has also developed ActionCode, a high-technology training system formed jointly with Perceptronics Inc. ActionCode provides in-house continuing education for physicians and their staffs. NEC's stock recently topped $32, 6 times its price the year before. So far, Bright's strategy is paying off; first quarter 1983 results were a record $1.8 million, a 35% increase over the year before. Bright sees $250 million in revenues by the end of 1985.

Simply Understanding High Tech
Englade, Kenneth F.
Advertising Age v54n26 PP: M-12,M-14 Jun 20, 1983 CODEN: ADVAAQ ISSN: 0001-8899 JRNL CODE: ADA
DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 2 Pages
AVAILABILITY: ABI/INFORM

It has become a monumental task to try to understand and keep track of developments in technologically advanced products. New information methods and procedures are being developed to try to ease this task. NCR Corp. recently began a program in which teams of experts help its sales representatives explain highly complicated products. There has been a huge proliferation of special-interest periodicals dealing just with technological developments. In an effort to stay current technologically, there has also been increasing specialization within advertising agencies. Some agencies have added engineers and software experts to their payrolls. Most of those dealing with high-technology products continue to favor the print medium for advertising to explain new developments, but some see the time coming when television

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will predominate. International Business Machines (IBM) has been exceptionally successful in using TV to sell its IBM Personal Computer, by simplifying it, stressing its benefits over its operation, and emphasizing its practicality over its technological developments. Demonstrations of complicated high-tech products have also been used successfully, especially if they approximate a life experience.

Conversation with Edson W. Spencer and Fosten A. Boyle
Tichy, Noel
Organizational Dynamics v11n4 PP: 21-45 Spring 1983 CODEN: ORDYAM ISSN: 0090-2616 JRNL CODE: ORD
DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 25 Pages
AVAILABILITY: ABI/INFORM
In an interview, Edson W. Spencer, chief executive officer of Honeywell Inc. (Minneapolis, Minnesota) and Fosten A. Boyle, vice-president of employee relations at Honeywell, project the ways in which economic changes expected in the 1980s and 1990s will affect human resources management at Honeywell. In 1982, Honeywell had more than 94,000 employees. The philosophy that has guided the company for 100 years is to maintain a ''restless spirit.'' Spencer foresees a much more competitive economy with slower growth in the 1980s and 1990s. Honeywell is looking for employees who can help the company grow faster than the economy as a whole because they have the skills to deal with the company's high-technology business. Honeywell is a teamwork-oriented company and is looking for employees that fit on that team.

The Engineering Education Crisis
Stata, Ray
New England Business v5n9 PP: 20,79-83 May 16, 1983 CODEN: NENBA3 ISSN: 0164-3533 JRNL CODE: NEN
DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 5 Pages
AVAILABILITY: ABI/INFORM
Whether there will be enough engineers in the future to sustain high technology growth in the US is questionable. The net growth of the engineering workforce is less than 2% annually. To achieve the 5% potential growth of the electronics industry workforce in the latter 1980s, the number of electrical engineers must double. Although engineering school enrollments have doubled, there has not been a commensurate increase in the capacity to educate engineers. Faculty staffing and laboratory facilities remain at previous levels, causing many schools to cap enrollments. Innovation, the major competitive edge the US has, is linked to the quality and vitality of research in graduate education, and the number of doctoral students in engineering schools is declining. The pressure caused by untenable faculty-student ratios detracts from the quality of undergraduate education and graduate research. The New England states must increase the percentage of state resources allocated to higher education, not just for public institutions, but to support targeted programs in private schools.

Multi-State Processes for Developing Rural Community Learning and Information Services
Peters, Betsy
Bulletin of ASIS v10n5 PP: 23-25 Jun 1984 CODEN: BASICR ISSN: 0095-4403 JRNL CODE: BAS
DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 3 Pages
AVAILABILITY: ABI/INFORM
The Intermountain Community Learning and Information Services (ICLIS) project started in 1980. Representatives from land-grant universities in Montana, Wyoming, Colorado, and Utah, plus one representative from the state library of each state, met to discuss mutual concerns about rural continuing education and information services and to develop a united plan of action. The necessity for a broad partnership utilizing community resources became obvious during the meeting. The ICLIS's organizational structure rests on 3 levels of responsiveness to rural needs: 1. a local community advisory committee, 2. a state advisory board, and 3. a multi-state advisory committee. Few librarians or educators have the required skills to use effectively much of the high technology available, especially in rural areas. Training of rural librarians and teachers is vital to the effective transfer and adoption of technologies in rural America. Map.

Low-Tech Education Threatens the High-Tech Future
Anonymous
Business Week n2783 PP: 95,98 Mar 28, 1983 CODEN: BUWEA3 ISSN: 0007-7135 JRNL CODE: BWE
DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 2 Pages
AVAILABILITY: ABI/INFORM
The poor status of US science education programs threatens to undermine domestic employment and the nation's economic standing in the world. Since the launch of Sputnik in 1957, the quality of scientific and technical education in the US has been slipping. Today, only 6% of US college students are registered in engineering programs. Less than one-third of US high schools require enough math and science to qualify students for entry into an engineering college. The general American public is considered technologically illiterate. There is a critical shortage of certified math and science teachers.

Teaching Tomorrow's Technology Today
Anonymous
Viewpoint v12n2 PP: 9-10 Mar/Apr 1984 ISSN: 0091-5017 JRNL CODE: VIE
DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 2 Pages
AVAILABILITY: IBM Corp., P.O. Box 2068, Atlanta, GA 30301
There are 24 Area Vo-Tech schools throughout Oklahoma that teach people the skills they need to be self-sufficient, productive members of the workforce. At each center, 20 instructional programs are available, ranging from auto mechanics to data processing. The Vo-Tech operation purchased the IBM System/34 and converted to a Virtual Machine (VM) operating system. Other IBM equipment is used, as well as support services and administration. In addition to the 4341 computer, there are Displaywriters, 5520 Administrative Systems, IBM Electronic Typewriter 85 typewriters, and various data entry terminals. At the Francis Tuttle Vo-Tech Center in Oklahoma City, an expansion is already being planned in the form of a new High Tech Center offering programs in computer technology, telecommunications technology, and related subjects.

The Business of Attracting Industry
Goldman, Marshall I.; Stafford, Howard A.; Templer, Mark
Technology Review v87n4 PP: 6-10,74 May/June 1984 CODEN: TEREAU ISSN: 0040-1692 JRNL CODE: TCR
DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 6 Pages
AVAILABILITY: ABI/INFORM
The success of such high-technology meccas as California's Silicon Valley, Massachusetts' Route 128 development, and Research Triangle Park, North Carolina, have led other locales to try to attract high-tech industries. Studies show that, for every new high-tech position created, 2 service jobs are created. Morever, high-tech development enhances and compounds other types of development. A major factor in the concentration of high-tech companies is the presence of major universities to feed the labor force. A variety of other variables important for attracting high-tech companies have been discovered. Surprisingly, though, the severity of local environmental laws has not proved to be particularly important, even for those companies with environmentally sensitive undertakings. Much more important are: 1. availability and cost of labor, 2. nearness to markets, and 3. business climate. A case study of entrepreneurial development around Route 128 near Boston, Massachusetts, is highlighted.

CA Education by Computer: A Programmed Approach
Anderson, Rodney J.
CA Magazine (Canada) v116n1 PP: 32-35 Jan 1983 CODEN: CCHAA5 ISSN: 0317-6878 JRNL CODE: CCA
DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 4 Pages
AVAILABILITY: ABI/INFORM
The education problems of the chartered accountancy profession need immediate attention. The growth of complexity and the advent of high technology have had an effect on these education problems. The growth of complexity can be minimized through high technology. Practitioners must learn something about handling complexity efficiently. More attention should be paid to organizing principles, modularity of knowledge storage and retrieval, hierarchical and other structures, and the architecture of information. To ultimately cope with complexity one must know the very patternness of patterns. The exploding field of computer technology contains the principles of organization, modularity, pattern-building, and information structure. Computer technology can help solve the current education problems by assisting chartered accountants directly in the provision of their professional services and by enabling the use of computer-based education. The technological revolution that is breaking upon the profession will permit it to do a very fine job in the future, if it seizes the opportunity. References.

Introducing the New Industrial Engineer
Pruett, James M.
Computers & Industrial Engineering v7n1 PP: 1-5 1983 CODEN: CINDDL ISSN: 0360-8352 JRNL CODE: CIE
DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 5 Pages
AVAILABILITY: ABI/INFORM
The role of the industrial engineer (IE) has changed a great deal in the past decade. The function of the new IE is toward improved technology. Some trends that have had an impact on the IE environment are: 1. the shift from a mass industrial society to an information society, 2. redistribution of labor and production because of instantaneously available information, 3. the move of society in the dual directions of high tech/high touch, and 4. restructuring of the work environment from top-down to bottom-up. Many of the ideas of the IE are the same as they were a decade ago but the tools and environment for implementing the ideas have changed. There is more opportunity and challenge for the IE than ever
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before and much of this is due to computer developments. The IE must be proficient in several programming languages and understand computer technology. References.

Overcoming the Technicalities of Technical Training in the United States/The U.S. Industry of the Future Is Here Today - Will It Be Gone Tomorrow?

Goddard, William A.; Dryer, Jerome L.

Business America v5n22 PP: 30-32 Nov 1, 1982 CODEN: COAMDP ISSN: 0361-0438 JRNL CODE: CT

DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 3 Pages

AVAILABILITY: ABI/INFORM

The need and the limited resources of many foreign countries are bringing increasing numbers of foreign students to the US for trade and technical training. However, the Nigerian Manpower Project, administered by the Agency for International Development, is one of the few government programs placing foreign students in US vocational schools. Since the program began in 1977, more than 2,500 Nigerian students have come to the US for 2 years of training. Such valuable programs should be developed by other countries. Over half the US workforce is in the fields of knowledge, information, and service. The US has established itself a clear leader in the high-technology field, but substantial trade barriers exist to exporting this technology. To improve this situation, the US needs to: 1. develop a clear information policy, 2. establish one agency of government to carry out the policy, and 3. accelerate negotiations with foreign countries to eliminate these trade barriers. If such moves are made, the government can expect cooperation from trade organizations like the Association of Data Processing Service Organizations.

The Growing Shortage of Talent

Henderson, Robert P.

Chief Executive n21 PP: 44-45 Autumn 1982 ISSN: 0160-4724 JRNL CODE: CHE

DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 2 Pages

AVAILABILITY: Chief Executive Magazine, Inc., 645 Fifth Ave., New York, NY 10022

The US faces a shortage of engineers, with as many as 35,000 needed. Much of the blame lies with the universities. Noncompetitive salaries for instructors, outdated equipment, and lack of facilities are given as prime reasons. During this shortage, company recruiters do what they have done for years: They increase engineers' salaries to reduce turnover. The result is that the cost of doing business rises, making US high technology even less competitive in world markets. Improving the quality of primary and secondary education and educators is the basic key to the long-term problem of the engineering supply. Some signs of progress exist. California, Florida, Ohio, and Texas are in the process of overhauling their education curricula to focus more on basic language and mathematics skills. These efforts are commendable, and so are those of the National Science Foundation, which has founded a commission to examine the effectiveness and potential of secondary school education.

High Tech's Workforce

Adams, Jane Meredith

New England Business v4n16 PP: 14-19 Oct 4, 1982 CODEN: NENBA3 ISSN: 0164-3533 JRNL CODE: NEN

DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 6 Pages

AVAILABILITY: ABI/INFORM

Peter B. Doeringer and Patricia Pannell, a professor and assistant professor of economics respectively, have prepared a report entitled ''Manpower Strategies for High Technology.'' The report is one of the chapters in New England's Vital Resource: The Labor Force. The demand for skilled technical workers has economists worried about the future of New England employment, but Doeringer and Pannell are less panicked about what some consider the employment crisis in New England: too few with the latest technical knowledge, too many with traditional manufacturing skills. In examining what might be done to guarantee that high technology remains in New England, Doeringer and Pannell studied why high-tech firms located in the region in the first place. The 2 authors believe that high-tech companies will have to compete with several rapidly growing industries, such as medical services and legal services, for highly educated professional and technical workers. Tables.

High Technology, Higher Education, and High Anxiety/Less Talk, More Action for Engineering Education

Botkin, James; Dimancescu, Dan; Stata, Ray; Petroski, Henry

Technology Review v85n7 PP: 48-57 Oct 1982 CODEN: TEREAU ISSN: 0040-1692 JRNL CODE: TCR

DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 10 Pages

AVAILABILITY: ABI/INFORM

The continued development of the US high technology industry depends on a well-trained supply of engineers and computer scientists. However, current trends in higher education indicate that the supply is dwindling. It will not increase without substantial cooperation among industry, government, and universities. Low faculty salaries have resulted in faculty shortages in major universities' electrical engineering and computer sciences (EE/CS) departments. In addition, capacity shortages and outdated equipment plague EE/CS departments. Greater corporate and government support are required to increase faculty salaries, to promote graduate fellowships, and to update equipment. Government support for high technology education should take the form of a long-term funding mechanism, such as that applied to land-grant colleges, which has proved highly successful in the growth of US agricultural production. Graphs.

Regional Report: Texas Looks to High Tech to Pull Up Economic Bootstraps/Boom Days Over?/Texas Looking to Beef Up High-Tech Education

Batt, Robert

Computerworld v16n38 PP: 55,66-67 Sep 20, 1982 CODEN: CMPWAB ISSN: 0010-4841 JRNL CODE: COW

DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 3 Pages

AVAILABILITY: ABI/INFORM

Because of the recession, the state of Texas is now emphasizing an increased investment in computer-related industries. The state must have a net gain of 170,000 new jobs a year to maintain current employment levels. The high-technology sector may offer a possible answer. Factors which are important to Texas in competing for high-technology industries include: 1. availability of raw materials, 2. good transportation facilities, and 3. availability of technically qualified personnel. The state needs a major research and development program. Recruitment practices for data processing personnel underwent a major reversal in 1982 as turnover decreased and companies sought less expensive employees. Since a good infrastructure of higher education is common in areas which attract high technology, Texas' ability to attract an ample supply of qualified persons is critical to its success in attracting high-technology industries. Many computer vendors support institutions of higher education through means such as equipment donations. There is still a need for more equipment support and for support of faculty fellowships.

Why Technical Training Will Prosper in the '80s

Zemke, Ron

Training v19n7 PP: 60,61 Jul 1982 CODEN: TRNGB6 ISSN: 0095-5892 JRNL CODE: TBI

DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 2 Pages

AVAILABILITY: ABI/INFORM

Technical training traditionally has been neglected by US management. However, the growth of high technology industries is forcing companies to change this attitude. The advent of robotics, computer-aided design and manufacturing (CAD/CAM) systems, microprocessor-controlled equipment, and flexible-use machine tools is creating a rapidly growing after-market in training. The trainer needs to know how to convert old skills to new ones by combining technical training with basic science and mathematics. Technical trainers will find themselves in great demand in the 1980s as they learn how to meet the challenges posed by high technology.

What's the Best Climate for DP Firms? Study Shows Notable Schools, Top Work Force Attract Firms/Future of Route 128 Belt Seen Threatened by Academic Ills/Midwest Best Bet for High Tech

Kirchner, Jake; Blakeney, Susan

Computerworld v16n27 PP: 71,80 Jul 5, 1982 CODEN: CMPWAB ISSN: 0010-4841 JRNL CODE: COW

DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 2 Pages

AVAILABILITY: ABI/INFORM

A study by the Congressional Joint Economic Committee (JEC) has revealed that although almost all states are trying to attract high-technology companies, only those with prestigious universities and skilled work forces can anticipate long-term success. Universities are major suppliers of technicians, engineers, and scientists which the firms need; they are the major source of new ideas, and they also add to the recreational and educational opportunities which employees of high-technology firms seek. A study by Elizabeth Useem of Northeastern University (Boston, Massachusetts) has revealed that a deterioration of technical academic programs in the area threatens the future of the Route 128 ''high-technology belt.'' Environmental factors causing the situation include school budget constraints, teachers planning to leave their profession, and poor relations between teachers and the high-technology industry. The JEC study found that the Midwest offers the best overall investment climate for high-technology firms due to the cost of labor and the excellence of academic institutions. It also has good ratings on cost of living and cultural amenities. All areas of the US, except the Far West and New England, are expected to increase their relative share of such companies.

Logisticians of the Third Kind

Ostrofsky, Benjamin

International Jrnl of Physical Distribution & Materials Mgmt (UK) v11n7 PP: 31-37 1981 CODEN: IPDJAX ISSN: 0020-7527 JRNL CODE: IPD

DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 7 Pages

AVAILABILITY: MCB Publications Ltd., 198/200 Keighley.Rd., Bradford, W. Yorkshire, England BD9 4JQ

Currently in the US, there are 2 types of logisticians: 1. those produced from the business college, and 2. those produced from the engineering college. Each is usually not aware that the other exists, each is in approximately the same dollar market, and both use the title of logistician. Due to the increasing complexity of technology and size of systems today, there is a demonstrable need for a third kind of logistician who is capable of meeting future increased dependence on high technology aids to solve increasingly large and complex problems in the logistics domain. Furthermore,

(cont. next page)

the obvious need exists to improve communications between the first 2 types of logisticians. As far as educational requirements are concerned, engineering colleges should include the notion of the wider meaning of performance in their emerging systems, while business colleges need to demonstrate increased awareness between the activities in the management of the firm and those in integrated logistics areas. Engineering colleges will probably be able to change more easily in recognition of the need for logisticians of the third kind. Figures. References.

Electronics Industry Threatened by Problems in Education: Exec

Scannell, Tim

Computerworld v16n22 PP: 51,56 May 31, 1982 CODEN: CMPWAB ISSN: 0010-4841 JRNL CODE: COW

DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 2 Pages

AVAILABILITY: ABI/INFORM

According to Ray Stata, chairman and president of Analog Devices, Inc. and founder of the Massachusetts High Technology Council, the computer and electronics industries are having problems in their own backyard - in corporations and educational institutions. Speaking at the Electro '82 electronics exhibition and convention, Stata noted that the US has the lead in technological innovation, but it is lagging in technological education. Only 6% of the bachelors' degrees awarded each year in the US are in engineering. Stata, co-author of a forthcoming book called Global Stakes: The Future of High Technology in America, argues that promoting and increasing engineering education should be a top US priority. As further insurance for engineering growth, he suggested giving senior technologists in an organization more power to influence corporate policy.

Improving the Maze of University Administration in High Technology Education

Newcomb, R. W.; DeClaris, N.

IEEE Transactions on Engineering Mgmt vEM29n2 PP: 62-67 May 1982 CODEN: IEEMA4 ISSN: 0018-9391 JRNL CODE: IEE

DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 6 Pages

AVAILABILITY: ABI/INFORM

The administrative structure in a high technology university is such that it alters the normal flow of general information. Instead, information is specialized, based on the interests of the faculty members. A study has been conducted to analyze this concept from the point-of-view of the professor. If a professor desires to make a study of an area of personal interest, and requires the support of other departments, he/she would have to obtain approval from higher administrative levels. The request for this approval would be processed through each succ sive level of authority until the final approval level is reached. Each one of the intermediate levels would input its approval or disapproval, based on inputs from its personnel. In order to minimize the complexity of this process, the university can revert to simpler administrative chains, create a new system, or insert ''maze breakers'' in the chain. The ''maze breaker'' is an outside person who acts as an arbitrator, serving to resolve conflicts created in the chain. Equations. Charts. References.

Why Industry Must Step in to Train Engineers

Anonymous

Business Week n2718(Industrial Edition) PP: 119-120 Dec 14, 1981 CODEN: BUWEA3 ISSN: 0007-7135 JRNL CODE: BWE

DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 2 Pages

AVAILABILITY: ABI/INFORM

Once Japanese graduates have been chosen to work at one of Japan's high-technology industries, they must continue their education with their companies in what amounts to a complete retraining effort. In terms of numbers, Japanese universities graduated nearly 87,000 engineers last year, compared with about 63,000 bachelors degrees granted in the US. The reason for the retraining effort is because the technical level and demands of Japanese industry have grown so much that it is now much harder for the Japanese educational system to meet corporate needs. The root of the problem most likely lies in the method the Japanese use to teach engineering. The Japanese are still concentrating on abstract science and rote learning of fundamental principles. As a result, engineering students gain very little practical laboratory experience. Several Japanese universities recently took the first tenative steps toward establishing laboratories to work in some of the technologies, however, such efforts have been largely stifled by a lack of funds or by faculty members who feared this kind of action would compromise the independence and esteem of their universities. Graph.

Education, the Workplace, and High Technology.
Smith, Charles E.
National Forum: Phi Kappa Phi Journal, v64 n2 p44-46 Spr 1984
Available from: UMI
Language: English
Document Type: POSITION PAPER (120)
Journal Announcement: CIJSEP84
For American education to keep pace with the rest of the world and provide the skilled workforce to meet the challenges of high technology, more national-level leadership is needed in the form of a plan to reform education and a clear and coordinated national policy for scientific training. (MSE)

Responding to the Economic Sputnik.
Marcuccio, Phyllis
Phi Delta Kappan, v64 n9 p618-20 May 1983
Available from: Reprint: UMI
Language: English
Document Type: JOURNAL ARTICLE (080); POSITION PAPER (120)
Journal Announcement: CIJNOV83
Despite need for a high-technology work force, science education has deteriorated since late 1950s. Necessary correctives include more science courses, better science teachers, curriculum reform, more dependable funding, rewards for teaching excellence, and a national curriculum for science education. Business/industry/education partnerships can help. (PB)

Are American Schools Turning out Technopeasants?
Hersh, Richard
Instructor, v92 n9 p26-29 May 1983
Available from: Reprint: UMI
Language: English
Document Type: JOURNAL ARTICLE (080); PROJECT DESCRIPTION (141); POSITION PAPER (120)
Journal Announcement: CIJJUL83
In a technological age, students must be able to process a bombardment of information and to use this information with high-technology machinery to solve complex problems. School curriculum must prepare children with advanced thinking skills and technological attitudes. Characteristics of schools which meet these demands are discussed. (PP)

Low-Tech Education Threatens the High-Tech Future.
Business Week, n2783 p95,98 Mar 28 1983
Language: English
Document Type: JOURNAL ARTICLE (080); PROJECT DESCRIPTION (141)
Journal Announcement: CIJJUN83
Indicating that the quality of scientific/technical education in the United States has been slipping since the brief surge of attention in the decade following Sputnik, discusses the need for upgrading science/technical education. Includes efforts currently under way, including financial support by industry and donations of equipment and computers to schools. (JN)

International Competitiveness in Electronics.
Congress of the U.S., Washington, D.C. Office of Technology Assessment.
Nov 1983 547p.
Report No.: OTA-ISC-200
Available from: Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.
EDRS Price - MF02/PC22 Plus Postage.
Language: English
Document Type: EVALUATIVE REPORT (142)
Geographic Source: U.S.; District of Columbia
Journal Announcement: RIENOV84
Government: Federal
Target Audience: Policymakers
This assessment continues the Office of Technology Assessment's (OTA) exploration of the meaning of industrial policy in the United States context, while also examining the industrial policies of several U.S. economic rivals. The major focus is on electronics, an area which virtually defines "high technology" of the 1980's. The assessment sets the characteristics of the technology itself alongside other forces that exert major influences over international competitiveness. Specific areas addressed include: electronics technology; structure, trade, and competitiveness in the international electronics industry; quality, reliability, and automation in manufacturing; role of financing in competitiveness and electronics; human resources (education, training, management); employment effects; national industrial policies; and U.S. trade policies and their effects. The report concludes by outlining five options for a U.S. industrial policy, drawing on electronics for examples of past and prospective impacts, as well as on OTA's previous studies of the steel and automotive industries. A detailed summary and introductory comments are included. Also included in appendices are case studies in the development and marketing of electronics products, a discussion of offshore manufacturing, and a glossary of terms used in the assessment. (JN)

Education for Jobs in a High Tech World: What Has Been Learned from Industry.
Long, James P.
5 Aug 1984 13p.; Opening address at the Virginia Statewide
(cont. next page)

Vocational Guidance and Counseling Conference (Roanoke, VA, August 5, 1984).
EDRS Price - MF01/PC01 Plus Postage.
Language: English
Document Type: CONFERENCE PAPER (150); POSITION PAPER (120)
Geographic Source: U.S.; Ohio
Journal Announcement: RIENOV84

Educators are increasingly turning to employers for advice about educating for future jobs. A recent project involved conducting a series of seven national conferences on high technology to learn about innovations in industry. Experts from industry told educators that industry itself does a great deal of high technology training, computers are the core of high technology, not everyone needs to know programming, programming jobs will increase, few pharmaceutical/biomedical technicians will be needed, robotics has come of age, computer-assisted design is revolutionizing drafting, semiconductors are still "hot," proprietary schools do a better job of educating, communications are growing and changing rapidly, the aerospace industry and the military are setting trends and creating innovations, and software is in a predicament. A panel of the National Academy of Sciences reported on the employer's view of competencies needed by the high school graduate for success in the workplace. The panel found that (1) the major asset required of high school graduates is the ability to learn and adapt to change in the workplace, (2) there are 10 core competencies that can provide the basic understanding and skills needed to perform entry-level jobs, and (3) a positive attitude and sound work habits are of prime importance. (YLB)

Education for California's Changing Economy. Observations and Suggestions from Nineteen Leaders of California Government, Business, and Education. Commission Report 83-35.
California State Postsecondary Education Commission, Sacramento.
Dec 1983 81p.; Original versions of these papers were presented at the Conference of the Western Interstate Commission of the Higher Education Technical Manpower Council (Sacramento,CA, May 3, 1983).
EDRS Price - MF01/PC04 Plus Postage.
Language: English
Document Type: POSITION PAPER (120); COLLECTION (020); CONFERENCE PAPER (150)
Geographic Source: U.S.; California
Journal Announcement: RIENOV84
Government: State

These statements by 19 of California's government, business, and educational leaders address the need to adapt California's schools and colleges to the rapid changes occurring in the State's economy and society. They have a common theme: government, business, and educational initiative and cooperation are needed if California is to retain its economic strength and assure its citizens' economic well-being. Ideas for consideration from these statements include the following: expanding economic and job opportunities depends on continued leadership in high technology markets, industries, and innovations; school reform is needed; a strategic plan for economic and educational policies must be developed; marketing the State requires a partnership of business, government, labor, and education; caution is needed regarding optimistic views of the impact of high technology on the labor force; concentration on high technology is taking away attention and resources from basic industries; California's economy depends on well-educated citizens with particular expertise in high technology; collaboration between universities and corporations in basic research can be to the advantage of each and to the State's and country's economic benefit; and the government should make a strong commitment to public education. Thirty-four strategies for increasing high-technology manpower in the West are appended. (YLB)

Vocational-Technical Education Act of 1983. Hearings before the Subcommittee on Elementary, Secondary, and Vocational Education of the Committee on Education and Labor, House of Representatives, Ninety-Eighth Congress, First Session on H.R. 4164 (November 1-3, 9, 1983).
Congress of the U.S., Washington, D.C. House Committee on Education and Labor.
Nov 1983 553p.; Parts of this document may not reproduce well due to small type.
EDRS Price - MF02/PC23 Plus Postage.
Language: English
Document Type: LEGAL MATERIAL (090); POSITION PAPER (120)
Geographic Source: U.S.; District of Columbia
Journal Announcement: RIEOCT84
Government: Federal
Target Audience: Policymakers

This document contains four Congressional hearings on H.R. 4164, the Vocational-Technical Education Act of 1983, to strengthen and expand the economic base of the Nation, develop human resources, reduce structural unemployment, increase productivity, and strengthen the Nation's defense capabilities by assisting the States to expand, improve, and update high-quality programs of vocational-technical education, and for other purposes. Witnesses provide recommendations, reactions, improvements, and suggestions relating to this bill, highlights of which include the focus on updating vocational education programs, the emphasis on high technology training programs operated in conjunction with industry, and the new authorizations for youth with special needs, adult training and retraining, and vocational guidance and counseling. The text of H.R. 4164 appears first. Testimony includes statements, prepared statements, letters, and supplemental materials from individuals representing the American Association of Retired Persons; National Association of State Boards of Education; American Vocational Association; American Association for Counseling Development; Council of
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Great City Schools; Vocational Education Regions 9, 10, 11, and 12; Correctional Education Association; National Coalition for Women and Girls in Education; American Association of School Administrators; Full Access and Rights to Education Coalition; Vocational Education Equity Council; National Association of State Directors of Vocational Education; Association of Independent Colleges and Universities; National School Boards Association; National Association of Community and Junior Colleges; Council of Chief State School Officers; National Association of Home Builders; National Alliance of Business; Committee for Economic Development; International Reading Association; and representatives in Congress. (YLB)

High Tech Schools: The Principal's Perspective.
Cromer, Janis
National Association of Secondary School Principals, Reston, Va.
1984 63p.
Report No.: ISBN-0-88210-159-5
Available from: Publications, National Association of Secondary School Principals, 1904 Association Drive, Reston, VA 22091 ($4.00 plus $2.00 shipping and handling; orders of $15.00 or less must be accompanied by payment).
EDRS Price - MF01 Plus Postage. PC Not Available from EDRS.
Language: English
Document Type: CONFERENCE PROCEEDINGS (021); NON-CLASSROOM MATERIAL (055); REVIEW LITERATURE (070)
Geographic Source: U.S.; Virginia
Journal Announcement: RIESEP84
Target Audience: Administrators; Practitioners
This report offers the conclusions of a 1983 EPCOT symposium on education and the Information Age involving distinguished national experts and 46 secondary school principals from across the country. Discussed in the first section on "The Demands of an Information Age" are a number of transitions, including current shifts from an industrial to an information work force, from a national to a global economy, and from a centralized to a decentralized society. Section 2, "The Future World of Work," includes a list of new technology-related occupations for the 1990's and reviews prospects for non-technology jobs, preparation for the 21st century, and business-education partnerships. In the following section, "High Tech is Here to Stay," the authors examine current uses and needs for computers in the classroom, the need for a definition of computer literacy, and gaining high tech acceptance. Exploring the "people side" of high tech, section 4 focuses on computer-aided instruction and professional development. Section 5's "action agenda" for creating high tech schools makes step-by-step recommendations for program implementation and discusses the role of the principal in realizing each step. The document concludes with a list of EPCOT conference participants. (JBM)

In Reality, High Tech Means Low Skills, Poor Pay.
Hollifield, John H.
Council for Educational Development and Research, Washington, D.C.
Educational R & D Report, v6 n1 p2-5 1983 [1983 5p.
Sponsoring Agency: National Inst. of Education (ED), Washington, DC.
EDRS Price - MF01/PC01 Plus Postage.
Language: English
Document Type: JOURNAL ARTICLE (080); POSITION PAPER (120)
Geographic Source: U.S.; District of Columbia
Journal Announcement: RIEAUG84
Government: Federal
Target Audience: Community; Counselors; Policy Makers; Practitioners
A look at the potential impact of high technology suggests that there may be a dim side to the popular view that high technology is the answer to America's educational and occupational problems. In reality, as technology advances continue, required job skills will decrease further. High technology will account for only 7 percent of all new jobs created between 1980 and 1990, while managerial, professional, clerical, and service occupations will account for 68% of the employment growth during this period. Contrary to the usual assumption that increasing technology will allow machines to perform the more tedious and less skilled tasks, high technology will actually further simplify and routinize work tasks and reduce the need for worker individualization and judgment. Educators must resist the pressure to concentrate on specific skill training that will become useless as job requirements change. Instead, education should prepare students for success by providing skills in logic, analytical reasoning, scientific knowledge, communication, and the cultural arts. By providing these skills in addition to on-the-job training and recurrent education at various times over the life-cycle (as technology changes job requirements), schools can best utilize high technology as a tool for learning rather than as a subject that will displace more fundamental learning. (LH)

Education and Jobs in a Technological World. Information Series No. 265.
Levin, Henry M.
Ohio State Univ., Columbus. National Center for Research in Vocational Education.
1984 36p.
Sponsoring Agency: Office of Vocational and Adult Education (ED), Washington, DC.
Contract No.: 300-83-0016
Available from: National Center Publications, National
(cont. next page)

Center for Research in Vocational Education, 1960 Kenny Road, Columbus, OH 43210 (IN 265--$3.25).
EDRS Price - MF01/PC02 Plus Postage.
Language: English
Document Type: POSITION PAPER (120)
Geographic Source: U.S.; Ohio
Journal Announcement: RIEJUL84
Target Audience: Administrators; Policymakers; Practitioners

A pressing problem in the United States today is that of employment: how to create enough jobs and, especially, what impact high technology will have on present and future jobs as well as educational need. Some policymakers see high technological industries as the basis for revitalizing the economy. The major challenge to education and training, according to this view, is to prepare adequate numbers of people with required high-level skills and to upgrade the present skill requirements of occupations. In this view, more, better, and more specialized education is needed. In contrast to these persons are those who predict that the effects of high technology on employment will be modest in both the number of jobs created and the skill level required, and that high technology will downgrade skill requirements of existing jobs as well as displace workers already in jobs. Furthermore, the labor force will not require expanded science and mathematics or computer literacy but will be employed in low-level service occupations. According to this view, the relatively small number of workers who will require higher-level skills will be able to obtain them through existing higher educational channels. In our view, what is needed is a comprehensive approach enabling persons to obtain the types of education and training that they need throughout their working lives. Such an approach, called recurrent education, would (1) respond to emerging educational needs, (2) cover a wide range of opportunities, and (3) by establishing a wide range of finance and information, allow persons to undertake a variety of educational and training experiences over a lifetime. Such a system should be a top priority for this country. (KC)

The Technology Program for the Atlanta Partnership of Business & Education, Inc.
McCarson, Carole S.
Atlanta Partnership of Business & Education, Inc., GA.
1984 14p.
EDRS Price - MF01/PC01 Plus Postage.
Language: English
Document Type: PROJECT DESCRIPTION (141)
Geographic Source: U.S.; Georgia
Journal Announcement: RIEJUL84

The Technology Program of the Atlanta Partnership of Business and Education, Inc. is designed to enhance the economic development of Atlanta through the collaborative efforts of private business, public schools, and higher education. In an effort to incorporate these communities into a single organization, the technology program has established a network linking the following organizations and sectors: the Atlanta Public Schools Technology Quadrangle, private business, higher education, the Georgia Research Consortium, the Atlanta Public Schools Information Technology Commission, and funders. The first of these organizations, the Atlanta Public Schools Technology Quandrangle, consists of four magnet schools directly related to technology that offer preparation for college, postsecondary training, or immediate job entry. Originally conceived in an effort to make Georgia competitive with other states in terms of attracting high technology companies, the Georgia Research Consortium (GRC) is currently utilizing the pooled resources of three postsecondary Georgia educational institutions to identify high technology growth opportunities and to provide the financial support needed to establish centers of excellence in the research universities of Georgia. The role of the Atlanta Public Schools Information Technology Commission in the network is to develop and implement a plan for expanding the use of microcomputers throughout the Atlanta school system. (MN)

The Role of the Business Community in Improving the American Education System.
Campbell, James B.
Chamber of Commerce of the United States, Washington, D.C.
8 Dec 1983 6p.; Paper presented at the Meeting of the National Forum on Excellence in Education (Indianapolis, IN, December 6-8, 1983).
EDRS Price - MF01/PC01 Plus Postage.
Language: English
Document Type: CONFERENCE PAPER (150); REVIEW LITERATURE (070); POSITION PAPER (120)
Geographic Source: U.S.; District of Columbia
Journal Announcement: RIEMAY84
Government: Federal

Historically, the business community has been concerned with educational issues. The United States Chamber of Commerce has had an active educational committee involved in shaping federal education policy since the 1960s. Local and state school systems, along with business leaders, parent-teacher associations, advisory boards, and school finance committees have also developed business/education partnerships. Three conditions have been identified that highlight the new challenges facing business and education leaders. First, there has been an increase in teen and adult illiteracy rates in the United States. Second, this country is facing severe shortages of skilled workers due to the shift from industrial to high technology jobs. Third, the United States is encountering unprecedented international competition. In recent years, educational improvement "success stories" have included activities such as adopt-a-school systems, fellowships and internships for teachers, loaned equipment, and initiatives for support of new school financing. Some partnerships between business and education are (1) Tenneco Oil Company and the

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Houston, Texas, Independent School District; (2) Pinellas Suncoast Chamber of Commerce and the Pinellas, Florida, Public School System; (3) the State of Mississippi and the Mississippi Economic Development Council; and (4) the State of California and the California Business Roundtable. (BJD)

Education and Work.
McGrath, Catherine H., Ed.
Stanford Univ., Calif. Inst. for Research on Educational Finance and Governance.
IFG Policy Notes, v4 n3 Sum 1983 1983 9p.
Sponsoring Agency: National Inst. of Education (ED), Washington, DC.
EDRS Price - MF01/PC01 Plus Postage.
Language: English
Document Type: POSITION PAPER (120)
Geographic Source: U.S.; California
Journal Announcement: RIEAPR84

The major issues surrounding the relationship between work and education now concentrate on the effects of education on productivity, on the effects of technology on the changing demand for education, and on the value of vocational education. In replacing the human capital theory of the value of education in the workplace, some recent theories hold that the major potential for education to increase productivity may be not in its job-specific training, but in its capacity to prepare persons to make decisions and to adapt to technological change. Although the common view holds that vocational students have better job market opportunities than others and that vocational schools reflect labor market demands, recent research contradicts both assumptions. Students in vocational programs, then, may be foregoing better preparation for the future work world. Like those about vocational education, two assumptions about the future of high technology education are also contradicted by available evidence: that the future will see fewer unskilled jobs and that the skill requirements of existing jobs will increase. Thus, a broad education is likely to be more, not less, important in a high technology future. (JW)

A Discussion Platform for the Futuring of Vocational Education.
Ruff, Richard D.
National Advisory Council on Vocational Education, Washington, D.C.
Jul 1983 24p.
EDRS Price - MF01/PC01 Plus Postage.
Language: English
Document Type: POSITION PAPER (120); REVIEW LITERATURE (070)
Geographic Source: U.S.; District of Columbia
Government: Federal
Target Audience: Policymakers

When formulating the platforms and plans for the future of vocational education, educational planners must consider the implications of the significant qualitative, social, and economic changes that are currently taking place in the worlds of business, industry, and labor as well as in the world of education at-large. An examination of current trends in the areas of high technology, labor force demographics, and organizational culture indicates that business and individual clients of vocational education will increasingly demand not only technical skills but also the work adjustment and interpersonal skills necessary to function in this new environment. Various factors, including the recent information explosion, demographic changes, and the rise of computer and related product technology have increased the need for life-long learning, for the acquisition of study and learning skills, and for improving students' occupational scientific literacy. Because of these societal trends, vocational education must institute approaches for integrating the delivery of occupation training and the knowledge and skills that make up what some have called the new basics--communication, information processing, science and mathematics, and computer literacy. In addition, vocational education faces significant challenges in the areas of diversity, issue management, and revitalization. (MN)

Speech presented by T. H. Bell, U.S. Secretary of Education, at the Conference on Entrepreneurship Education (Arlington, Virginia, January 27, 1982).
Bell, T. H.
Department of Education, Washington, DC. Office of the Secretary.
27 Jan 1982 16p.
EDRS Price - MF01/PC01 Plus Postage.
Language: English
Document Type: CONFERENCE PAPER (150); POSITION PAPER (120)
Geographic Source: U.S.; District of Columbia
Journal Announcement: RIENOV83
Government: Federal

The federal role in the teaching of entrepreneurship skills development in the public schools is one of advocacy and leadership and one that will assist states and local education agencies to infuse and include entrepreneurship skills training into broad occupational program areas, career awareness, general training, and specific skills training. Besides exposing students to the history of underlying ideas and principles of the free enterprise system and entrepreneurship, it is vitally important to teach them specific entrepreneurial skills, such as self-organization. Other overlooked sources of entrepreneurial skills are books that have influenced the growth and development of the American economic system. The success of entrepreneurship and new ventures rests both on the general health of the economy and the nation's broader social climate. Important to
(cont. next page)

successful entrepreneurship are the various levels of government favor or disfavor and a cooperative spirit between educational establishments and the needs of business entrepreneurs. Dramatic contributions have been made by the nation's entrepreneur high-technology companies, and the administration in turn has begun to respond by encouraging a substantial upgrading of mathematics and science instruction through block grants to the states. (JMK)

Business and the Future of Education. Sequoia Action Brief #1.

Hawkins, Robert B., Jr.
Sequoia Inst., San Jose, Sacramento, CA.
Jul 1982 22p.
EDRS Price - MF01/PC01 Plus Postage.
Language: English
Document Type: POSITION PAPER (120)
Geographic Source: U.S.; California
Journal Announcement: RIEOCT83

Many entry level employees do not have the skills to become productive members of the work force. The nationwide decline in educational performance is documented by functional illiteracy among 13 percent of white 17-year-olds, and 42 percent of black 17-year-olds; a decline in the national average scores on the Scholastic Aptitude Test (SAT); and increasing school dropout rates. High technology, a service-oriented society, the integration of immigrants, and global competition offer new challenges to the ability of American education to produce a competent work force. At fault is the overregulated and uncontrolled education system. Consumers are denied a direct impact on basic education policies, and policy control within the system is split between the state and various local governments and agencies. The conditions for true accountability and effectiveness can only be created at the local level, with the exception of matters of funding equalization and academic goals that should be established and supported by state legislatures and universities. The business community can help achieve local control by defining exactly what schools should accomplish to prepare high school graduates to enter the world of work and by offering support for the return of authority over the educational process to local communities. (MLF)

National Perspective on Cooperative Education.

Worthington, Robert M.
19 Apr 1983 16p.; Address to the meeting of the Cooperative Education Association and the Canadian Association for Cooperative Education (Toronto, Ontario, April 19, 1983).
EDRS Price - MF01/PC01 Plus Postage.
Language: English
Document Type: CONFERENCE PAPER (150); POSITION PAPER (120)
Geographic Source: U.S.; District of Columbia
Journal Announcement: RIEOCT83
Government: Federal

From a national perspective, cooperative vocational education is becoming increasingly important. As the country changes from a manufacturing to a service economy, many traditional jobs are being eliminated, while new jobs are being created, especially in the information field. In order to prepare employees for these jobs, a partnership between the schools and the private sector is needed. Schools will benefit by providing quality education on the cutting edge of the new technology, and the private sector will benefit by getting qualified employees at less cost for recruiting and training. At the national level, Congress funds programs of national significance, which include (1) national discretionary projects, (2) the National Center for Research in Vocational Education, (3) six regional curriculum coordination centers, and (4) the National Occupational Information Coordinating Committee. These programs of national significance support the functions of applied research and curriculum development, demonstration, dissemination, and training. Through these programs, improvements can be made in education, including cooperative education. Research findings to date indicate that cooperative education leads to a positive attitude of students toward office occupations and higher job performance ratings from employers. Further efforts are needed to determine the effects of cooperative programs on productivity, minority employment, the work ethic, job satisfaction, employment of handicapped persons, high technology, entrepreneurship, and articulation from secondary to postsecondary education. All signs now point, however, to the benefits of cooperative programs to the employer, to the students, and to the community. (KC)

Vocational-Technical Education Interface with Ohio's High Technology Business and Industrial Sector. Final Report.

McCormick, Robert W.
Ohio State Advisory Council for Vocational Education, Columbus.
Apr 1983 41p.
EDRS Price - MF01/PC02 Plus Postage.
Language: English
Document Type: RESEARCH REPORT (143)
Geographic Source: U.S.; Ohio
Journal Announcement: RIESEP83

This study explored the relationship of vocational-technical educational institutions in Ohio with business and industry using high-technology applications. The study attempted to determine what high-technology applications will be adopted by Ohio's business and industry in the next 5 years, what experience the schools have had in working with high-technology industries, what skills are needed by employees and students entering this job market in the next 5 years, and how these educational needs can be met. Personal interviews were conducted with 32 educators and 15 industry

(cont. next page)

executives in the manufacturing area. The study found that although the executives are supportive of vocational education, they do not view vocational education as a resource for training persons for high-technology positions. The executives pointed out that vocational education is usually carried out on the high school level and they would not want high school graduates working on their high-technology machinery. Instead, the executives expect to do most of their own in-plant training for high-technology jobs. They want to employ technical education graduates of two-year or four-year colleges for these positions. The consortium approach between business and education appears promising and has worked well where tried. One job tackled by the consortium approach has been the retraining of instructors to teach high-technology subjects. The executives stressed that students should take mathematics, science, and computer courses in order to qualify for industry training in high-technology companies. This could be provided in a "pre-technical" high school vocational education option. (KC)

The Occupational Impact of Significant Technological Innovation: Hi-Tech and the Jobs Future. Research Review No. 11.

Stanley, Patrick A.

Hawaii State Occupational Information Coordinating Committee, Honolulu.

Jan 1983 14p.

EDRS Price - MF01/PC01 Plus Postage.

Language: English

Document Type: REVIEW LITERATURE (070)

Geographic Source: U.S.; Hawaii

Journal Announcement: RIEAUG83

Government: State

Impacts from the major high technological changes now underway cut across all industrial sectors and most occupational clusters. Technological innovation can increase or decrease the total number of types of jobs. Decline in employment may be offset, however, by new applications and capabilities of goods and services or by employment shifts. While fairly clear estimates of where technology will affect industry have been made, it is not always clear what occupational titles are involved. Different studies have suggested varying occupational growth rates. A joint labor union-management program has been called for to ensure workers of an early-warning system of advanced information about management plans for future innovations that might cause job losses or other problems. More frequent skills upgrading of technical personnel will be required due to accelerating technological obsolescence. Job content and worker qualities will be increasingly modified. New linkages between the private sector and vocational education programs will be required to keep the curriculum current and graduates employable. As technological change occurs faster, a revolution will be seen in the need for and delivery of occupational information to keep individuals aware of labor market needs. (YLB)

Statewide Conference on High Technology. Proceedings (Austin, Texas, October 7-8, 1982).

Texas Advisory Council for Technical - Vocational Education, Austin.; Texas Education Agency, Austin.

Jan 1983 95p.

EDRS Price - MF01/PC04 Plus Postage.

Language: English

Document Type: CONFERENCE PROCEEDINGS (021); POSITION PAPER (120)

Geographic Source: U.S.; Texas

Journal Announcement: RIEJUL83

Government: State

These proceedings contain 11 papers that focus on how education must change what and how it teaches to keep up with the technological revolution. The presentations address the need for vocational education to produce students with skills in electronics and data communications (including computer-to-cbmputer transmission); office systems and management of information; computer-aided design and manufacturing; robotics (including definition, need, technologies involved, major applications, and required skills); private sector initiatives to deal with social or economic problems; the role of vocational education in meeting the technical manpower needs of the energy industry; the need for workers with skills in biomedical engineering--both clinical engineering and bioengineering; the need for workers in the aerospace industry with skills in computer software, computer systems operations and maintenance of computer systems, software, and machines; high technological instructional options, especially industry/education cooperation; implications of high technology for education; and the need for the frequent re-education of workers and teachers caused by technological change. A final section provides comments from leaders in industry, government, and education regarding high technology, education, and the economy. (YLB)

Education in a High Technology World: The Case of Route 128.

Useem, Elizabeth

Northeastern Univ., Boston, MA. Inst. for the Interdisciplinary Study of Education.

Jun 1982 83p.

Sponsoring Agency: National Inst. of Education (ED), Washington, D.C.

Available from: 33 Mosman Street, Newton, MA 02165.

EDRS Price - MF01/PC04 Plus Postage.

Language: English

Document Type: RESEARCH REPORT (143)

Geographic Source: U.S.; Massachusetts

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Journal Announcement: RIEMAR83

The relationship between high technology firms and educational institutions in the Boston metropolitan area was studied. Attention was focused on the responsiveness of public schools, community colleges, and four-year colleges and universities to the demands of the industry for technically trained personnel. The influence of companies on educational policies and the development of links between the two institutions were also explored. Information was gathered from: personal interviews with 130 officials from education, industry, and government; a survey of 158 secondary mathematics and science teachers at high schools on Route 128; reanalysis of a national survey of American high school seniors in 1980 commissioned by the National Center for Education Statistics; and review of documents and reports. It was found that there is considerable interest on the part of students and school administrators at all levels of education in courses and programs of study that would lead to technical careers. However, the capacity of educational institutions to respond to student interest is limited by budgetary considerations. A shortage of staff and equipment exists in all programs. Industry support for the schools is concentrated mainly on baccalaureate and postgraduate degree programs. There are a few cases of mutually satisfying cooperation programs between the companies and other sectors of education; but, for the most part, school-industry ties are fragmentary, weak, and of short duration. It is concluded that despite new interest in industrial-education partnerships, it is highly unlikely that corporations will be able to provide schools with the resources traditionally supplied by government funds. A bibliography is appended. (Author/SW)

Education and High Technology Industry: The Case of Silicon Valley. Summary of Research Findings.

Useem, Elizabeth

Aug 1981 34p.

EDRS Price - MF01/PC02 Plus Postage.

Language: English

Document Type: RESEARCH REPORT (143)

Geographic Source: U.S.; Massachusetts

Journal Announcement: RIEMAR83

The relationship between high technology companies and educational institutions in northern Santa Clara County, California, a major center of technologically sophisticated industry, was studied. Attention was directed to the way that educational institutions in Silicon Valley are changing to meet the demands of a transforming technology. Over 100 interviews were conducted in 1981 with the officials from education, industry, and government, and documents were reviewed. It was found that public schools have been the least responsive and that elite institutions of higher education, especially Stanford University, have the most responsive to the demands of the high technology economy in Santa Clara Valley. Community colleges and four-year universities are making efforts to develop or expand programs congruent with the needs of science-based local industry. These institutions are struggling to find the staffing and resources needed to establish and maintain the programs. Industry managers who were interviewed generally did not believe that an infusion of funds was necessary to upgrade and redirect the public school curricula. Executives were more willing to donate funds, personnel, and equipment to community colleges and universities because students were closer in age to starting employment and because funds could be easily targeted to specific programs. Rapidly developing industries like electronics have special characteristics that create strain for industry-education relations. Undergraduate student enrollments in engineering and computer science are growing in Santa Clara Valley, but the current output of students from undergraduate and graduate programs is not keeping pace with the demands of rapidly growing industry. (SW)

Proceedings of the Symposium on the Effects on Technology of a Vanishing Species: Mathematics and Science Teachers.

State Univ. of New York, Albany. School of Education.

21 May 1982 39p.

Available from: The Institute for School Development, State University of New York at Albany, 135 Western Avenue, Husted 211, Albany, NY, 12222 ($3.50).

EDRS Price - MF01/PC02 Plus Postage.

Language: English

Document Type: PROJECT DESCRIPTION (141); CONFERENCE PROCEEDINGS (021)

Geographic Source: U.S.; New York

Journal Announcement: RIEFEB83

The symposium whose proceedings are included in this document was designed to inform diverse segments of society of the catastrophic decline in the supply of mathematics and science teachers. It was also seen as a first step in a continuing dialogue among educators, legislators, and corporate executives in New York State. The symposium was, thus, structured as a "lighthouse" endeavor focusing on sensitizing the non-education community, in particular, high-technology industry, to a situation which will have enormous, deleterious effects on their ability to expand, to modernize, and to reap the rewards of technological advancement. Issues/topics discussed include: (1) myths about the mathematics/science teacher shortage (pay teachers more and shortage will disappear, retraining is the answer, talented people will be unaffected by inadequate/inappropriate instruction in foundation courses of science and mathematics); (2) data on the extent of the shortage; and (3) Regent's initiatives, including a proposal of a joint business/industry/education effort to enable capable high school students to enroll in collegiate programs preparing them for teaching in elementary/secondary schools for 3 years and then to enter positions in business and industry. Twenty recommendations from three working groups are also reported.

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How Much "Tech" Do High-Tech Workers Need?
Rumberger, Russell W.
VocEd, v59 n4 p32-34 May 1984
Available from: UMI
Language: English
Document Type: POSITION PAPER (120)

Students will need an increased understanding of technology for their jobs and for their lives as adults. Vocational education must prepare them for the unknown future, to give them the skills they need to survive and prosper. (JOW)

Vocational-Technical Education and High Technology Industries: Working Together.
Denny, Charles
Wisconsin Vocational Educator, v8 n1 p1-3,22 Win 1984
Available from: UMI
Language: English
Document Type: POSITION PAPER (120); CONFERENCE PAPER (150)
Journal Announcement: CIJMAY84
Discusses the needs of the technology industry and the role of vocational education in meeting those needs. (JOW)

Teacher Training and High Technology.
Peters, G. David
Music Educators Journal, v70 n5 p35-39 Jan 1984
Available from: UMI
Language: English
Document Type: POSITION PAPER (120)
Journal Announcement: CIJAPR84
The advent of high technology into the classroom raises the issue of proper computer training of both undergraduate students and the current teacher population. Teachers must learn a new terminology, acquire computer skills, and develop understanding of hardware and software availability and usefulness. (CS)

The Growing Imbalance between Education and Work.
Rumberger, Russell W.
Phi Delta Kappan, v65 n5 p342-46 Jan 1984
Available from: UMI
Language: English
Document Type: RESEARCH REPORT (143)
Journal Announcement: CIJAPR84
Although many recent reports on the United States educational system urge increased investment in education to prepare students for the jobs of a high-tech future, a more immediate problem is that of the large proportion of the labor force which is currently "overeducated" or "underemployed." (JBM)

Getting Started in High Technology.
Fuller, Jack W.
Educational Horizons, v62 n1 p24-25 Fall 1983
Available from: UMI
Language: English
Document Type: POSITION PAPER (120)
Journal Announcement: CIJMAR84
Defines the term "high technology" and recommends that community college educators be prepared to respond to the need or training in this area. Warns against continuing to prepare students for obsolete jobs and encourages planning programs that are flexible and capable of responding quickly to change. (NRJ)

Meeting the Needs for a High-Technology America.
Henderson, Robert P.
USA Today, v112 n2462 p47-49 Nov 1983
Available from: UMI
Language: English
Document Type: POSITION PAPER (120)
Journal Announcement: CIJFEB84
America needs more students trained in basic science and engineering than the educational system is now providing. Schools must raise their standards and demand more of their students and teachers. Suggestions for upgrading the high school curriculum and the teacher training curriculum are given. (IS)

If Productivity Is the Problem...Special Publication Series No. 38.
Huddleston, Kenneth F.
Ohio State Univ., Columbus. National Center for Research in Vocational Education.
Jun 1982 48p.; For related documents, see ED 214 577, ED 217 149, and CE 034 957-960. Prepared in cooperation with the American Association of Community and Junior Colleges, the American Society for Training and Development, and the American Vocational Association.
Sponsoring Agency: Office of Vocational and Adult Education (ED), Washington, DC.
Contract No.: 300-78-0032
Available from: National Center Publications, Box F, 1960 Kenny Road, Columbus, OH 43210 (Order No. SN36--$4.95).
EDRS Price - MF01/PC02 Plus Postage.
Language: English
Document Type: POSITION PAPER (120); REVIEW LITERATURE (070)
Geographic Source: U.S.; Ohio
Journal Announcement: RIEJUL83

Curriculum Articulation as a Means of Meeting the High Technology Challenge.

Knight, Mary

4 Dec 1983 8p.; Paper presented at the American Vocational Association Convention (Anaheim, CA, December 4, 1983).

EDRS Price - MF01/PC01 Plus Postage.

Language: English

Document Type: POSITION PAPER (120); CONFERENCE PAPER (150)

Geographic Source: U.S.; Florida

Journal Announcement: RIEJUN84

Education is being constantly criticized for its failure to produce literate graduates. Reformers are urging a return to basics, a more rigorous curriculum, and results that can be measured on achievement tests. Vocational education also is being criticized. Opponents think that vocational education prepares graduates for a narrow range of job skills that soon become obsolete. To defuse such criticism and do a better job of preparing students for the future, vocational education will have to change. More emphasis should be put on preparing students for a broad spectrum of jobs and for the retraining they will probably face in the future. At the same time, vocational education will have to improve coordination of programs between secondary schools, community colleges, and vocational institutes so that students can receive the training they need without wasting time in moving from one program to another. Program planners on all levels must begin to work together to reduce institutional jealousies in order to provide coordinated programs that prepare vocational students for the future. If vocational educators do not improve articulation voluntarily, state legislatures will enact laws to force them to do so. Florida, for example, has enacted legislation that mandates coordinated programs between various levels and sets statewide standards for courses, while putting tighter controls on the offerings of community colleges and vocational institutes. Vocational education can meet the needs of students if vocational educators cooperate to increase articulation between and among their programs. (KC)

The Labour Market Impacts of High Technology: Implications for the Universities.

Selleck, Laura J.

Council of Ontario Universities, Toronto. Research Div.

Nov 1983 33p.

Available from: Council of Ontario Universities, 130 St. George Street, Suite 8039, Toronto, Ontario M5S 2T4, Canada.

EDRS Price - MF01/PC02 Plus Postage.

Language: English

Document Type: REVIEW LITERATURE (070); POSITION PAPER (120)

Geographic Source: Canada; Ontario

Journal Announcement: RIEMAY84

Implications for universities of high technology industries and the labor market are unclear. There is a need to ease the transition for those categories of workers who will be affected: women, low- and medium-skill workers in manufacturing, and certain categories of middle-level managers. The provision of highly qualified personnel is the universities' most obvious role in a technological society; the good jobs of the future will require more scientific knowledge and higher technical skills. However, it is less certain that this kind of training is required for the entire labor force. The five occupations expected to produce the most new jobs are all in low skilled areas: janitors, nurses' aides, sales clerks, cashiers, and waiters and waitresses. There is evidence that traditional middle-level jobs in manufacturing and business will be highly susceptible to displacement or deskilling because of the introduction of robotics and various information technologies. Universities need to conduct research on the long-term impact of microelectronics and other technologies, including the characteristics of new jobs, and the broader societal impacts. Retraining programs will have to concentrate on generic skills with emphasis on the ability to adapt and learn.

National Survey of Training Services to Business and Industry through Vocational Education.

Edwards, William A.; Schmutzler, Mark

West Virginia State Dept. of Education, Charleston. Bureau of Vocational, Technical, and Adult Education.

Sep 1982 107p.

EDRS Price - MF01/PC05 Plus Postage.

Language: English

Document Type: RESEARCH REPORT (143)

Geographic Source: U.S.; West Virginia

Journal Announcement: RIEMAY84

Government: State

This project was conducted to describe state programs of economic development concerned with state-provided training for industry and to share the results among the states. Surveys were sent to the 50 state directors of vocational education plus the directors in the District of Columbia, Guam, Puerto Rico, and the Virgin Islands. Of the surveys sent, all but 11 were returned. The results of the survey showed that all 43 respondents claim that they provide training services to business and industry; however, many states do not have specific economic development programs or funding to provide for training to the private sector. In most states with targeted funds for business and industry training, a cooperative, coordinated effort is being made to solve not only the training needs, but also to provide help in site selection, funding, and tax abatement. It would appear that 31 of the 43 respondents have specific programs whose personnel work closely with other state agencies in meeting the needs of business and industry. Most of the states have 0-4 full-time staff members involved in training. Most training efforts are for manufacturing and electronics/high technology industries, although a wide range of other companies are served. Most of the companies served are new or expanding.

Student Achievement in America: State Policy Implications for a High Technology Economy.

Anderson, Beverly L.; Ward, Barbara J.

Education Commission of the States, Denver, Colo. National Assessment of Educational Progress.

Aug 1983 29p.

Sponsoring Agency: National Inst. of Education (ED), Washington, DC.

Grant No.: NIE-G-80-0003

Report No.: NAEP-AY-HT-35

Available from: National Assessment of Educational Progress, Box 2923, Princeton, NJ 08541.

EDRS Price - MF01/PC02 Plus Postage.

Language: English

Document Type: POSITION PAPER (120); RESEARCH REPORT (143)

Geographic Source: U.S.; Colorado

Journal Announcement: RIEMAR84

Target Audience: Policymakers

Three aspects of the match between education and the demands of our changing economic situation are examined. First, the skills students will need for the future are identified. These skills included competencies in reading, writing, speaking and listening, mathematics, science, reasoning, basic employment, economics, and computer literacy. Second, current levels of achievement with respect to these skills are explored. The data are drawn from the results of the National Assessment of Educational Progres (NAEP) in reading, mathematics, science, writing, literature, and consumer competencies. The overall NAEP findings were not particularly encouraging, especially for 17-year-olds. This paper concludes by making suggestions for correcting this mismatch between current achievement levels and necessary skills. It is recommended that educators first examine the lists of skills needed, determine which are appropriate for individual states or communities, and sort through those skills with business and industry leaders and parents. Then these groups should act in concert to remedy the problems they face. Primary type of information provided by report: Procedures (Analysis). (BW)

Impact of the "Steel Collar" Revolution and Robotics upon Higher Education. AIR 1983 Annual Forum Paper.

Todd, Edward S.

May 1983 22p.; Paper presented at the Annual Forum of the Association for Institutional Research (23rd, Toronto, Ontario, May 23-26, 1983).

EDRS Price - MF01/PC01 Plus Postage.

Language: English

Document Type: POSITION PAPER (120); CONFERENCE PAPER (150)

Geographic Source: U.S.; New York

Journal Announcement: RIEDEC83

The need for higher education to plan curricula based upon generalizable human, analytical, and technical skills is discussed in view of historical and economic changes, productivity questions, demographic projections, and employment forecasts. Questions are posed regarding the form of undergraduate education that will best prepare the college graduate for employment in a society marked by high technology and automation and characterized by a more impersonalized, highly efficient work and nonwork environment. The following factors are credited as affecting the implementation of automated equipment and robotics: productivity rates, manpower supply, preparation of manpower, cost of physical capital, cost of human capital, and the state of the art of the technologies. It is concluded that the education of the 1980s, 1990s, and the 21st century must prepare the graduate for growth, adaptability, and further learning. Students must be prepared to be skilled in analysis and problem solving. The new technologies will require a higher level of verbal and mathematical literacy to work in the processing of information. Higher education in the future should contain essential elements for on-the-job scientific and technical training. (SW)

Youth Jobs Programs: The Critical Need for a Comprehensive Strategy. Testimony before the House Education and Labor Committee.

Taggart, Robert

Remediation and Training Inst., Alexandria, VA.

7 Mar 1983 21p.

EDRS Price - MF01/PC01 Plus Postage.

Language: English

Document Type: POSITION PAPER (120)

Geographic Source: U.S.; Virginia

Journal Announcement: RIEDEC83

In times of economic recession, dollars for job training and job placement programs grow scarcer, and those that are available tend to go to middle-class workers who are displaced or temporarily unemployed. The structurally unemployed--primarily the poor, the less educated, and minority youth--find it harder to compete for the needed training, and their situation becomes even more desperate than it is in times of recovery or economic growth. Common sense, equity, and efficiency would argue for exactly the opposite approach, beginning earliest with jobs targeted on areas and groups with the most severe problems. Youth programs should be first, not last, on the agenda; and among youth programs, those combining work, education, and training for the most disadvantaged, rather than conservation experiences for the most advantaged, should receive first priority

Demystifying High Technology. Occasional Paper No. 97.
Rumberger, Russell
Ohio State Univ., Columbus. National Center for Research in Vocational Education.
1984 25p.
Available from: National Center Publications, Ohio State University, 1960 Kenny Road, Columbus, OH 43210 (OC 97--$2.50).
EDRS Price - MF01/PC01 Plus Postage.
Language: English
Document Type: POSITION PAPER (120); CONFERENCE PAPER (150)
Geographic Source: U.S.; Ohio
Journal Announcement: RIEJUL84
Two myths about high technology are that it will be the primary source of new jobs and that it will vastly upgrade the skill requirements' of jobs. Evidence does not support these myths. Most new jobs will not be in high tech fields, and technology will reduce the skill requirements. The Bureau of Labor Statistics predicts that high tech occupations will grow rapidly until 1990, but the actual numbers of jobs that will be created are quite small in comparison to other occupational categories. Technology is shaping the future economy by other forces. Robotics, automation, sophistication of some technologies, and movement of jobs overseas will result in job loss. New jobs will be created by technology in production and maintenance of robots. Skill requirments will also be affected. Reduced skills will be needed to use word processing equipment, computers, and cash registers. Educational implications from these changes include the need to increase and strengthen basic education; the need to strengthen the idea of lifelong, recurrent education; and the need to gear training and education toward adaptability and flexibility. Questions and answers about high technology, vocational education, and changes in the nature of work conclude the document. (YLB)

Education and Training for a Technological World. Information Series No. 267.
Lemons, C. Dale
Ohio State Univ., Columbus. National Center for Research in Vocational Education.
1984 51p.
Sponsoring Agency: Office of Vocational and Adult Education (ED), Washington, DC.
Contract No.: 300-83-0016
Available from: National Center Publications, National Center for Research in Vocational Education, 1960 Kenny Road, Columbus, OH 43210 (IN 267--$4.25).
EDRS Price - MF01/PC03 Plus Postage.
Language: English
Document Type: POSITION PAPER (120)
Geographic Source: U.S.; Ohio
Journal Announcement: RIEJUL84
Target Audience: Policymakers; Administrators; Practitioners
Today, this country is facing awesome challenges. Technology is changing all aspects of life, while work force requirements shift rapidly, swelling the numbers of workers who need to be retrained. At the same time, information technologies are creating changes in the automated office. Higher-level literacy is required for most workers in this sector. As the economy moves from an industrial to an information base, the mass educational approach designed to turn out productive workers for industry is no longer deemed appropriate. Rather, education for the future must be improved; not only must schools reemphasize the basics, they must expand the traditional curriculum to include communications, higher-level problem-solving skills, and scientific and technological literacy. Whereas only 7 percent of this country's new jobs will be in high-technology occupations, programs to train workers for these jobs must be designed and implemented quickly if the United States is to compete in the international marketplace of the new global economy. Educators at all levels should cooperate to provide their students with higher levels of mathematics, language, science, and computer literacy skills, along with critical thinking and reasoning skills. (This paper provides information about and examples of the types of programs needed to prepare persons for the new technological jobs that are emerging.) (KC)

The Educational Implications of High Technology.
Lévin, Henry M.; Rumberger, Russell W.
Stanford Univ., Calif. Inst. for Research on Educational Finance and Governance.
Feb 1983 24p.; Figure 1 may reproduce poorly due to small print of original document.
Sponsoring Agency: National Inst. of Education (ED), Washington, DC.
Grant No.: 08-NIE-G-80-0111
Report No.: IFG-PR-83-A4
Available from: Publications, Institute for Research on Educational Finance and Governance, School of Education, CERAS Building, Stanford University, Stanford, CA 94305 ($2.00).
EDRS Price - MF01/PC01 Plus Postage.
Language: English
Document Type: POSITION PAPER (120)
Geographic Source: U.S.; California
Journal Announcement: RIEOCT83

The changes to be effected by high technology in both projected employment growth and existing jobs seem to require significant changes in the American educational system. However, government estimates for the period 1978-90 suggest that employment growth will favor jobs that require little or no training beyond the high school level (for instance, janitors, nurses' aides, sales clerks, cashiers, and restaurant workers). Although the percentage of high technology occupations will increase quickly over this decade, the contribution of these jobs to total employment will be quite small. On the other hand, the evidence from past and present applications of technology to existing jobs suggests that future technologies will lead to further job fragmentation (where work tasks are simplified or routinized) and job "deskilling" (the reduction of opportunities for worker individuality and judgment). While such mechanization does reduce labor costs, it also allows management to control more easily the pace of production. This assessment favors a solid basic education over narrow vocational preparation, since a strong general education improves understanding of modern complexities and enhances worker adaptability in a changing job market. Quick and efficient response by educators to training needs and recurrent education are also important, since workers' skills may not be useful over their entire work lives. (PB)

Technological Change and Social Competence.
Smith, Robert Irvine
Jun 1983 29p.; Paper presented at the Annual Conference of the Social Science Education Consortium (Athens, GA, June 8-11, 1983).
EDRS Price - MF01/PC02 Plus Postage.
Language: English
Document Type: POSITION PAPER (120); CONFERENCE PAPER (150)
Geographic Source: United Kingdom; England
Journal Announcement: RIENOV83

Schools in Great Britain can respond to the current demands of industry, government, and technological advancement and at the same time maintain their own priorities: critical thinking, a concern for values, and access to noncommercial forms of cultural expression. Because of the economic crisis, schools are being urged to help produce a work force with the qualities and skills needed to make Britain competitive in a world of high technology. Economic survival has become a major goal and many educators, business people, and government officials call for a curriculum that would develop technological capability together with a cluster of attitudes and beliefs appropriate to an industrialized democracy. Educators are encouraged to employ new teaching aids (e.g., computers), develop new topics, and teach new skills. Current responses to these challenges include a project on technology and change at York University, collaboration between schools and industry, and experimental social education courses focusing on the role of information in a modern society. Related to these projects is the need to provide special training for educators. Yet, given adequate communication and regrouping of forces within education, the core curriculum can address both economic survival and individual well-being, capability and a critical spirit, skill and understanding, and social competence and moral autonomy. (KC)

Technician Manpower in the South: High Tech Industries or High Tech Occupations?
Galambos, Eva C.
Southern Regional Education Board, Atlanta, Ga.
1983 28p.
Available from: Southern Regional Education Board, 1340 Spring Street, NW, Atlanta, GA 30309 ($3.00).
EDRS Price - MF01/PC02 Plus Postage.
Language: English
Document Type: POSITION PAPER (120)
Geographic Source: U.S.; Georgia
Journal Announcement: RIENOV83

Two paths may be followed to project training needs for high technology: concentration on the employment composition of high technology industries or focus on high technology occupations. The pervasiveness of high technology occupations appears to verify the wisdom of considering total industry employment in manpower planning for high technology occupations. While there has been interest in expanding the supply of engineers and computer personnel, less has been said about manpower needs at the technician level. An adequate supply of engineering and science technicians who are trained primarily in postsecondary institutions below the baccalaureate level will be equally important to the revitalization of industry. While the state employment agency projections of the occupational demand for engineering and science technicians in several southern states indicate a balance between supply and demand, these projections may not

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reflect the dynamic changes taking place. When demand for engineering and science technicians is measured on the basis of more dynamic projections--on the basis of what the demand would be if southern states were to employ the same proportion in their industries as is projected for the nation in 1990--need for expansion of training programs below the baccalaureate level for engineering and science technician exists. (YLB)

The Economic and Social Impacts of the Transition from the Industrial Society to a Computer Literate, High Technology, Information Society.

Groff, Warren H.

22 Apr 1983 57p.; Presented at the Colloquium, "Impact of the Increasing Service/Manufacturing Industries Ratio" of the Ohio Academy of Science (Bowling Green, OH, April 22, 1983).

EDRS Price - MF01/PC03 Plus Postage.

Language: English

Document Type: REVIEW LITERATURE (070); POSITION PAPER (120); CONFERENCE PAPER (150)

Geographic Source: U.S.; Ohio

Journal Announcement: RIEOCT83

As our society evolves from an industrial society to a computer literate, high technology, information society, educational planners must reexamine the role of postsecondary education in economic development and in intellectual capital formation. In response to this need, a task force on high technology was established to examine the following topics: the development of a perspective or a futures scenario for Ohio; human resource development of providers and consumers of postsecondary educational services; equipment and capital plan expenditures; and implications for program development, approval, and evaluation. After analyzing Ohio's strengths and weaknesses as well as its opportunities for and the threats against its successful transition to a high technology information society, members of the task force concluded that the evolution of a technetronic society in Ohio can develop in a systematic way if the state can manage the issue of intellectual capital formation. What is needed is a conceptual framework to guide Ohio and its institutions in such a way as to focus science and technology on the individual and quality-of-life issues. In response to this need, the task force has developed a detailed plan of action concerning strategic planning, human resource development, capital planning, and program development and review for the 1983-1985 biennium. (A summary of the specific task force recommendations is appended.) (MN)

Government: Federal

Target Audience: Community

"Industrial policy" is an ambiguous term; however, diverse elements of our society can agree that "industrial policy" can be thought of as a combination of all the policies and practices that affect or are the consequences of a nation's ability to compete--policies and practices in the areas of international trade, capital investment, technological innovation, and human resources. Our primary thrust toward an industrial policy at present is the recognition that the United States must increase its industrial productivity. Before productivity can be increased, the following facts must be faced: (1) we are moving into a new economic era, one characterized by emphasis on information/high-technology/service industries; (2) productivity in this country has been too low for nearly 10 years; (3) a high-quality education is the essential foundation upon which this new economic era will be constructed; and (4) the American educational system is in trouble with too many functional illiterates and too many high school graduates who cannot read and add. Human resources are our raw materials for creating a new industrial order; therefore, our educational system must do a better job of preparing students for it. The present administration is attacking the problems in American education by reducing government regulations, emphasizing more basic and applied research, and emphasizing quality education and retraining. Recent grants have been made for projects to determine how technology can be used to improve education. Demonstration projects and "lighthouse" projects will be conducted to show how schools can use computers; the television show "3-2-1 Contact" has been funded, and studies of computer use in the classroom have begun. If our nation's productivity and competitiveness are to increase, an improvement in the educational system is necessary. (KC)

Strategic Planning for Economic Development.

Groff, Warren H.

4 Dec 1983 12p.; Presented at the American Vocational Association Convention (Anaheim, CA, December 2-6, 1983).

EDRS Price - MF01/PC01 Plus Postage.

Language: English

Document Type: CONFERENCE PAPER (150); POSITION PAPER (120)

Geographic Source: U.S.; Ohio

Journal Announcement: RIEAPR84

The Ohio Task Force on High Technology (TFHT) was formed in 1982 to make recommendations in four areas: (1) the development of future scenarios for Ohio; (2) human resource development of providers and consumers of postsecondary educational services; (3) equipment and capital plan expenditures; and (4) implications of high technology for academic program development, approval, and evaluation. Through a series of meetings and creation of working papers and models, the TFHT developed 11 recommendations under these four goal areas. In general, the committee noted that the United States is experiencing the onset of a transformation

from an industrialized to a technical society based on information. For Ohio, this trend will mean the loss of jobs unless the postsecondary establishment, in concert with other parts of society, accepts a commitment to strategic planning and management. Collection and analysis of data should begin with the Ohio Board of Regents undertaking an analysis of strengths, weaknesses, and opportunities in order to clarify the role of technical education in economic development. From there, a multi-year action plan could be derived. The commitment to strategic planning and management should be paralleled by a commitment to human resource development. With regard to capital planning, additional money is required to support high technological equipment, and program development must be synchronized with such equipment purchase. In the area of program development and review, more emphasis should be placed on the requirements of high technology programs and the development of more innovative programs. Pulling together these four aspects of the educational process should result in a better system for Ohio to meet the challenges of an information-oriented technical society in the years to come. (A summary of recommendations is attached.) (KC)

Lehigh: One University's Approach to Rejuvenating U.S. Industry.
Lepkowski, Wil
Chemical and Engineering News, v62 n20 p37-38,40-41 May 14 1984
Language: English
Document Type: PROJECT DESCRIPTION (141)
Journal Announcement: CIJSEP84
Discusses Lehigh University's industry-funded centers and institutes, academic research projects designed to upgrade both industry and the economy, and research and development programs. Includes information on sources of research and development funding. (JN)

A Dilemma--Scholarship vs. Entrepreneurship.
Krebs, Robert E.
Journal of the Society of Research Administrators, v15 n4 p19-28 Spr 1984
Available from: UMI
Language: English
Document Type: POSITION PAPER (120)
Journal Announcement: CIJAUG84
Four suggested basic principles that universities and industries may consider when developing cooperative agreements that will reduce conflicts of interest are: relevance, loyalty, fairness, and trust. These may be used for the development of new, cooperative ventures to support university research. (Author/MLW)

University-Industry Relations: A Review of the Literature.
Baldwin, Donald R.; Green, James W.
Journal of the Society of Research Administrators, v15 n4 p5-17 Spr 1984
Available from: UMI
Language: English
Document Type: REVIEW LITERATURE (070)
Journal Announcement: CIJAUG84
More than 100 books, articles, and papers concerning university-industry relations are identified by the Literature Subcommittee of the Society of Research Administrators. Mutual interests, obstacles to cooperation, solutions to problems, and emerging trends are highlighted. (MLW)

Perspectives on Emerging Technical Careers and Higher Education.
Miller, Harry G.; Haenni, Gene
Technological Horizons in Education, v11 n2 p123-27 Oct 1983
Available from: UMI
Language: English
Document Type: JOURNAL ARTICLE (080); PROJECT DESCRIPTION (141)
Journal Announcement: CIJJAN84
Examines some of the major issues impacting higher education as a result of increased technology's relationship to economic development. Areas addressed include institution/program accreditation, role of higher education in economic development, industry support of research funding, search for skilled labor by employers, and others. (JN)

We Must Build a Strong Technological Infrastructure.
Naka, F. Robert
Professional Engineer, v53 n3 p12-16 Fall 1983
Available from: Reprint: UMI
Language: English
Document Type: JOURNAL ARTICLE (080); GENERAL REPORT (140)
Journal Announcement: CIJDEC83
Discusses crises in general education, in university basic research, and in industry, suggesting that educational institutions, industry and government must each play a role in revitalizing United States industrial preeminence in world markets. Outlines possible solutions for dealing with foreign competition. (JN)

Academe and Industry Debate Partnership.
Culliton, Barbara J.
Science, v219 n4581 p150-51 Jan 14 1983
Available from: Reprint: UMI
Language: English
Document Type: JOURNAL ARTICLE (080); PROJECT DESCRIPTION (141)
Journal Announcement: CIJJUN83
A conference was held at the University of Pennsylvania (December 1982) to discuss university-corporate relations in science and technology. Issues discussed included, among others, whether academic researchers can enter into contracts with industry without sacrificing important university values and the limits to university-industry collaboration. (JN)

The University, Industry, and Cooperative Research.
Giamatti, A. Bartlett
Science, v218 n4579 p1278-80 Dec 24 1982
Available from: Reprint: UMI
Language: English
Document Type: JOURNAL ARTICLE (080); PROJECT DESCRIPTION (141)
Journal Announcement: CIJJUN83
Yale University intends to issue a statement of policy governing the nature and extent of university and faculty
(cont. next page)

involvement in the commercial application of scientific research. Highlights of the policy statement and issues related to faculty involvement with profit-oriented companies and conditions of grants and contracts are discussed. (Author/JN)

Computer-Based Learning: The Key 'Technological Multiplier' for Technology Transfer.
Reynolds, Angus
Training and Development Journal, v36 n10 p64-67 Oct 1982
Available from: Reprint: UMI
Language: English
Document Type: JOURNAL ARTICLE (080); EVALUATIVE REPORT (142)
Journal Announcement: CIJJAN83
The use of computer-based learning (CBL) is discussed. The author examines the appropriate use of the technology; its cost; identifying the best potential applications of CBL; and the use of CBL by major airlines, oil companies, universities, manufacturers, and government. (CT)

Careers with a Future: Where the Jobs Will Be in the 1990s.
Cetron, Marvin; O'Toole, Thomas
Futurist, v16 n3 p11-19 Jun 1982
Language: English
Document Type: JOURNAL ARTICLE (080); POSITION PAPER (120)
Journal Announcement: CIJSEP82
Describes where new job opportunities will be in the next 20 years. To stay employed, workers must accept new technologies and be willing to be retrained in new skills. Future patterns in unemployment and the changing relationships of government, labor unions, and private industry are discussed. (AM)

University-Industry Connections--The GURC Example.
Sharp, James M.; Gummick, James L.
Journal of the Society of Research Administrators, v12 n2 p15-21 Fall 1980
Available from: Reprint: UMI
Language: English
Document Type: JOURNAL ARTICLE (080); PROJECT DESCRIPTION (141)
Journal Announcement: CIJMAR82
Industry research is seen as inherently interdisciplinary while university research consists almost exclusively of a single discipline. Experiences of the Gulf Universities Research Consortium, which has representatives from both academe and industry, are described. (MLW)

Science and Industry.
Crawford, Allan R.
Science, v213 n4512 p1076-77 Sep 1981
Available from: Reprint: UMI
Language: English
Document Type: JOURNAL ARTICLE (080); POSITION PAPER (120)
Journal Announcement: CIJJAN82
Presents the viewpoint of a North American industrialist that the support of basic science by industry is essential for its future growth. (CS)

A Way to End the IC Designer Shortage.
Robinson, Arthur L.
Science, v209 n4453 p260-61 Jul 1980
Available from: Reprint: UMI
Language: English
Document Type: JOURNAL ARTICLE (080); RESEARCH REPORT (143)
Journal Announcement: CIJDEC80
Discusses the problem of the shortage of engineers capable of designing advanced integrated circuits (IC) and presents some suggestions for increasing the number of IC designers in universities and semiconductor companies. (HM)

University-Industry Interaction Patterns
Roy, Rustum
Science, 178, 4064, 955-960 Dec 1972
Language: ENGLISH
Journal Announcement: CIJEABST
Discusses existing and possible models for the promotion of cooperative research between industry and universities, some of which also invblve state and federal funding of basic research. Urges experiementation to determine the effectiveness of the models as large scale industrial laboratories are eliminated. (AL)

Critical Issues: An Endangered People.
Williams, Ronald
Planning and Changing, v14 n1 p5-14 Spr 1983
Available from: Reprint: UMI
Language: English
Document Type: JOURNAL ARTICLE (080); POSITION PAPER (120); RESEARCH REPORT (143)
Journal Announcement: CIJNOV83
Outlines the "calamitous prospects" facing the poor in America, especially poor Blacks, due to undereducation and the movement of the economy away from industrial production to high technology and communication. Proposes strengthening public school instruction through cooperation of schools and colleges to provide an alternative future. (JBM)

Orange County's TEC Center.
Lusk, Kathy
VocEd, v58 n4 p41-42 May 1983
Available from: Reprint: UMI
Language: English
Document Type: JOURNAL ARTICLE (080); PROJECT DESCRIPTION (141)
Journal Announcement: CIJAUG83
The Orange County Technology Exchange Center brokers information county-wide between eight community colleges and four regional occupational training programs and technologically oriented programs. The Center has four main goals: (1) act as a clearinghouse to develop needed training programs, (2) promote and coordinate training resources, (3) assist planners with training programs, and (4) coordinate upgrading and retraining. (JOW)

The Changing Work Place: Perceptions, Reality. Trend Analysis Program.
American Council of Life Insurance, Washington, D.C.
Mar 1984 21p.
EDRS Price - MF01/PC01 Plus Postage.
Language: English
Document Type: REVIEW LITERATURE (070)
Geographic Source: U.S.; District of Columbia
Journal Announcement: RIEOCT84
An examination of the changes that are likely to occur in work and productivity in the future reveals that, at least before the year 2000, Americans are not likely to see many new jobs created and will probably not be required to alter their skills greatly for existing jobs. It will be difficult to duplicate the sustained productivity attained during the first two decades following World War II. While it is true that high technology is entering the workplace at an ever accelerating pace, it is easy to overstate the impact of these changes. Faced with increasingly better educated and more affluent employees, employers are turning to changing employer-employee relations as a means of satisfying workers' quests for self-esteem. Included among the problems already affecting the workplace, and likely to continue to do so, are the increase in the numbers of displaced workers and declining areas, the underclass and feminization of poverty, and the existence of fewer entry-level jobs as older workers delay retirement. These factors have a number of implications for the insurance industry that industry planners must take into account when developing products and planning promotions for them. (MN)

Putting America Back to Work: Role of the Community College.
Ellison, Nolen M.
11 Oct 1983 15p.; Paper presented at the National Conference of the League for Innovation in the Community College (Newport Beach, CA, October 10-12, 1983).
EDRS Price - MF01/PC01 Plus Postage.
Language: English
Document Type: CONFERENCE PAPER (150); POSITION PAPER (120)
Geographic Source: U.S.; Ohio
Journal Announcement: RIESEP84
Target Audience: Practitioners
Community colleges have the opportunity to systematically link their mission and role to national economic purposes and human resource development strategies. To take advantage of this opportunity, community college leaders, at the national, state and institutional levels, must be willing to commit to a new understanding of the roles these institutions must play in the post-industrial, high-technology society. In fall 1981, in an effort to formulate a national two-year college strategy in the area of career education/training and to link two-year colleges to the emerging national economic agenda, an American Association of Community and Junior Colleges (AACJC) task force was formed to address the prospects of "Putting America Back to Work," through, for example, the development of a National Small Business Training Network, work to improve communications about and understanding of the Job Training Partnership Act, and a Kellogg Foundation initiative designed to provide assistance in building a network of public and private sector organizations committed to human resource development. Future steps of community colleges should emphasize: (1) the goal of excellence and the achievement of high standards; (2) improved worker productivity and related work habits; (3) institutional change and adaptation in support of the nation's economic development agenda; (5) high technology applications and careers; and (6) the educational applications of technology, computers, microwave transmission, and other tools. (LAL)

University-Industry Research Relationships. Selected Studies.
National Science Foundation, Washington, D.C. National Science Board.
[1982 298p.; For related document, see ED 230 115.
Report No.: NSB-82-2
Available from: Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402.
EDRS Price - MF01/PC12 Plus Postage.
Language: English
Document Type: RESEARCH REPORT (143); BIBLIOGRAPHY (131)
Geographic Source: U.S.; District of Columbia
Journal Announcement: RIESEP84
Government: Federal
Target Audience: Practitioners; Policymakers
The results of a study of university/industry research interactions are presented, along with four reports on collaboration, and an annotated bibliography. The study, "Current U.S University/Industry Research Connections" (Lois S. Peters, Herbert I. Fusfeld, and others), involved on-site interviews with 66 companies and 61 public and private universities that were top-ranking research and development institutions. The focus was fields of study in the physical and life sciences, plus some social science, business, and medical education programs. Types of interactions formed four major groupings: general research support, cooperative research support, support for knowledge transfer, and technology transfer. Appendices include a geographical listing of each of 475 research interactions, including the names of the institutions, the discipline, the mechanism of interaction, and the duration. Report titles and authors are as follows: "State College Science and Engineering Faculty: Collaborative Links with Private Business and Industry in California and Other States" (Frank and Edith Darknell); "University-Industry Connections and Chemical Research: An Historical Perspective" (Arnold Thackray); "University-Industry Cooperation in Microelectronics and Computers" (Erich Bloch, James D. Meindl, and William Cromie); and "Report on a National Science Foundation Workshop on Intellectual Property Rights in Industry-University Cooperative Research" (National Science Foundation). (SW)

Private Sector Involvement with the Vocational Community: An Analysis of Policy Options. Information Series No. 281.
Maurice, Clyde F.
Ohio State Univ., Columbus. National Center for Research in Vocational Education.
1984 120p.; For related documents, see ED 241 746-750, ED 241 758, and CE 038 698.
Sponsoring Agency: Office of Vocational and Adult Education (ED), Washington, DC.
Contract No.: 300-83-0016
Available from: National Center Publications, National Center for Research in Vocational Education, 1960 Kenny Road, Columbus, OH 43210 (IN281--$8.75).
EDRS Price - MF01/PC05 Plus Postage.
Language: English
Document Type: REVIEW LITERATURE (070)
Geographic Source: U.S.; Ohio
Journal Announcement: RIESEP84
Target Audience: Policymakers
In order to provide federal policymakers with an adequate background of information on the issues of vocational education and private sector (VEPS) cooperation, an analysis was made of the context of current VEPS cooperative practices. The analysis revealed that although the concept of cooperation is simple and appealing, it is very difficult to implement. Several factors appeared to undermine the effectiveness of cooperative activities. Included among these were the following: the existence of current cooperative practices that are described as fragmented, duplicative, and ad hoc; the use of volunteerism as the basis for cooperation; and the lack of available funds for vocational education linkage activities. When these factors are coupled with other underlying issues (such as the infringement of the private sector in the training enterprise, delineation of who should bear the cost of training, and the perceived inability of vocational educators to respond quickly to technological changes), the dire need for policy initiatives in this area becomes evident. Based on an analysis of these issues, four policy options were set forth that gave rise to 28 policy alternatives. These alternatives were then limited to 12 possible policy alternatives. (Appended to this report are a sample listing of VEPS cooperating practices, and an initial evaluation of 28 policy options.) (MN)

Area Consortium on Training. "Training for Technology" Project, 1982-1983. Final Report.
Moock, Lynn D.
Area Consortium on Training, Fremont, CA.
1 Dec 1983 35p.
EDRS Price - MF01/PC02 Plus Postage.
Language: English
Document Type: PROJECT DESCRIPTION (141)
Geographic Source: U.S.; California
Journal Announcement: RIEAUG84
The Area Consortium on Training initiated the Training for Technology Project to fill industry needs for skilled personnel and job needs for economically disadvantaged persons. Major accomplishments included establishment of a training team for economic development and for development of training programs; contacting of more than 100 employers; provision of information/contacts on local labor market needs and future trends; submission of the first joint training programs by Ohlone College, the Fremont-Seward Regional
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Occupational Program, and the Fremont Adult School; creation and securing of funding of four retraining programs in electronics/robotics and computer-aided drafting (CAD); acquisition of CAD and robotics equipment for Ohlone College; funneling of 60 disadvantaged students into training programs; and building of trust and rapport among business, educational, and governmental representatives. These barriers to cooperative education were identified: initial doubt about the usefulness of the effort; concerns about "turf"; breaking traditional roles; encountering different mindsets and vocabulary; facing time constraints; and funding. Recommendations to educators regarding customized training were: strengthening of the infractructure of vocational education; maintenance and expansion of partnerships with business and government; and development of local expertise. (Some news releases are appended.) (YLB)

Handbook for Business/Industry/Education Partnerships. Bulletin 1983, No. 29.

Alabama State Dept. of Education, Montgomery.

1983 35p.

EDRS Price - MF01/PC02 Plus Postage.

Language: English

Document Type: NON-CLASSROOM MATERIAL (055)

Geographic Source: U.S.; Alabama

Journal Announcement: RIEJUL84

Government: State

Target Audience: Practitioners; Community

This handbook contains broad guidelines for increasing cooperation among business, industry, labor, governmental agencies, professionals, parents, students, and educators through the creation of business/industry/education partnerships. The material is designed primarily to provide a framework for building or improving such partnerships or councils rather than to develop a rigid set of instructions for operating councils. Focus is on how to develop community, regional, and state mechanisms to serve as links between the labor force and education. An introduction lists what individuals as well as businesses and industries can do in partnership efforts. The second section on forming business/industry/education councils covers setting objectives, council management, the role of the state coordinator, and council functions. The relationship of the partnership council to other community and educational councils is then briefly addressed. Section 4 discusses several broad categories and examples of council activities, including instruction and curriculum development, resource workshops, inservice training, career guidance, materials and service functions, educational management, shadowing suggestions, and adopt-a-school programs. The final section is a one-page state-of-the-art summary for partnerships among business, industry, and education. The appendix contains an historical perspective for Alabama's business/industry/education partnerships. (YLB)

Joint Industry/University Cooperation with Federally Supported Research Facilities. Hearing before the Subcommittee on Investigations and Oversight of the Committee on Science and Technology. U.S. House of Representatives, Ninety-Eighth Congress, First Session.

Congress of the U.S., Washington, D.C. House Committee on Science and Technology.

13 May 1983 181p.; Document contains small print, may have marginal legibility.

EDRS Price - MF01 Plus Postage. PC Not Available from EDRS.

Language: English

Document Type: LEGAL MATERIAL (090)

Geographic Source: U.S.; District of Columbia

Journal Announcement: RIEMAY84

Government: Federal

Target Audience: Policymakers

These hearings focused on issues related to the joint use of federally-funded research facilities by industry and universities. Testimony of witnesses, prepared statements, and supporting documentation (including the Stevenson-Wydler Technology Innovation Act of 1980, Public Law 96-480) are provided.

A Model for Improving the Responsiveness of Technical and Community Colleges to the Training Needs of Industry.

Iverson, Maynard J.

3 Dec 1983 12p.; Paper presented at the American Vocational Association Convention (Anaheim, CA, December 3, 1983).

EDRS Price - MF01/PC01 Plus Postage.

Language: English

Document Type: PROJECT DESCRIPTION (141); CONFERENCE PAPER (150)

Geographic Source: U.S.; North Carolina

Journal Announcement: RIEMAY84

A North Carolina project identified the elements influencing an institution's responsiveness to industry and developed a model to improve the efficiency and effectiveness of that response. Data were collected through structured interviews at each of 15 top-rated colleges and with representatives of two industries with whom the college had worked. Responsiveness models were generated using the findings, a literature review, and project advisory committee inputs. Major findings were presented at three regional dissemination workshops. Implementation strategies were discussed, and subjective evaluation of the models were secured from experienced personnel who attended. Nineteen elements affecting institutional responsiveness to industry were identified as being of "some" to "extreme" importance. The top six elements referred specifically to college commitment, policy, and/or activities that included reliability of the institution, strong personal commitment of the president to industry training, high quality of instruction provided, quick response and follow-through by the institution, tailoring of courses to meet specific industry needs, and flexibility of the

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institution. (Six figures show the participating colleges, weighted listing of elements, elements placed in six major factors, levels of responsiveness of institutions based on the factored elements and the services provided, and the combined responsiveness model.) (YLB)

Communication Industry Needs and Higher Education Programs: What Are We Doing Now to Prepare for 1990?
Larkin, Paul
14 Jul 1982 10p.
EDRS Price - MF01/PC01 Plus Postage.
Language: English
Document Type: EVALUATIVE REPORT (142); POSITION PAPER (120)
Geographic Source: U.S.; Maryland
Journal Announcement: RIEAPR84

Projected workforce requirements in 1990 were related to trends in degrees awarded. A Delphi panel discussed impacts of new technology and problems of technical worker supply in the field of communications, which was used as an example of a changing industry. Delphi participants were provided information about past employment and were told about the forecasts of the Bureau of Labor Statistics' model. After estimating the size of the labor force, the panel projected the number of jobs by 1990. The group also discussed growth trends in communications technology, including problems of supply and the nature of teamwork required in the changing industry. After examining projections and trends for the communications industry as a whole, the panel considered the radio and television broadcasting industry and specific occupations within those industries. It is suggested that since new technologies are creating new job categories, community colleges in particular will have to be flexible and responsive to the changing needs of the industry in order to provide the number of technicians and the team mix required. Implications for policy include an urgent need for college-level teachers of science, math, and engineering; higher standards for math and science in our public schools; and national priorities for workforce training before the end of the 1990s. (SW)

Industry and Education...Partners in Ag Mechanization. Proceedings (Moline, Illinois, November 1-3, 1982).
John Deere Co., Moline, Ill.
Nov 1983 247p.
Report No.: ISBN-0-86691-041-7
Available from: Deere and Company, Service Training Dept., 1400 - 3rd Avenue, Moline, IL 61265 ($5.00).
EDRS Price - MF01 Plus Postage. PC Not Available from EDRS.
Language: English
Document Type: CONFERENCE PROCEEDINGS (021); POSITION PAPER (120)
Geographic Source: U.S.; Illinois
Journal Announcement: RIEAPR84
Target Audience: Practitioners; Community

These proceedings contain summaries of the panel discussions and workshops as well as texts of the individual papers and reaction papers presented at a conference that focused on key issues of concern to educators and industry involved in the education and training of agricultural machinery technicians. Addressed during the conference were the following areas: the role of industry in agricultural mechanization education; recruiting and providing quality postsecondary instructors and keeping these same instructors technically and educationally competent; the goals and problems of curricula at the secondary, postsecondary, and university levels; interfacing agricultural mechanization programs and ways in which schools and industry can cooperate to resolve problems associated with on-the-job training; funding strategies and funding sources; and future challenges and opportunities for educators and industry. The appendices include lists of the planning committee, participants, workshops and the conference agenda. An author and a subject index of papers and reports is also attached.

...Perspective of Organized Labor on Improving America's Productivity. Occasional Paper No. 89.
Edwards, Kenneth R.
Ohio State Univ., Columbus. National Center for Research in Vocational Education.
Feb 1983 22p.
Available from: National Center Publications, The Ohio State University, 1960 Kenny Road, Columbus, OH 43210 (OC89--$2.50).
EDRS Price - MF01/PC01 Plus Postage.
Language: English
Document Type: POSITION PAPER (120)
Geographic Source: U.S.; Ohio
Journal Announcement: RIEAUG83

Labor continues to be an important factor in increased productivity. Mounting evidence shows that unionized workers are more productive than nonunionized workers and that unionization increases productivity in an establishment. Technological advances have resulted in jobs that require more technical preparation than a high school diploma or undergraduate degree. Eighteen of 19 jobs need technical training, work experience, or training in a particular skill or group of skills. Organized labor has moved to deal with technological changes through contract provisions and technological change clauses in collective bargaining agreements. A clearly articulated national policy is necessary to help schools keep pace with workers' training needs. Industry needs to develop and expand training programs, such as in-house training, on-the-job training, tuition aid programs, and apprenticeship. Organized labor and vocational education must cooperate to better train workers. Research concerns should include cooperation between vocational education and the apprenticeship system, promotion of sex

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equity by vocational education, and equal access to vocational education. (Questions and answers are appended.) (YLB)

As Others See Vocational Education. Book 1: A Survey of the National Association of Manufacturers. Research and Development Series No. 225A.

Nunez, Ann R.; Russell, Jill Frymier

Ohio State Univ., Columbus. National Center for Research in Vocational Education.

1982 32p.; For a related document see CE 032 561.

Sponsoring Agency: Office of Vocational and Adult Education (ED), Washington, DC.

Contract No.: 300-78-0032

Available from: National Center Publications, The Ohio State University, 1960 Kenny Road, Columbus, OH 43210 ($3.75).

EDRS Price - MF01/PC02 Plus Postage.

Language: English

Document Type: RESEARCH REPORT (143)

Geographic Source: U.S.; Ohio

Journal Announcement: RIEAUG83

A survey of manufacturers was conducted to assess views of National Association of Manufacturers members about vocational education, including its effectiveness, collaborative activities with vocational education, and manufacturers' suggestions for improvement. Findings based on the 775 returned surveys were that the most frequent grade awarded to secondary vocational education was a "C"; "B" was the most frequent grade for postsecondary vocational education. Over 50 percent of the respondents indicated their company benefited from vocational education. Most manufacturers (85 percent) preferred hiring vocational graduates for a job requiring less than a four-year college degree. Manufacturers' willingness to engage in cooperative activities was generally high. Work experience was most preferred as a form of collaboration; on-site use of company equipment was least preferred. Problems in collaboration included inadequate planning, inflexible scheduling, and poor quality training. Three-fourths of the respondents preferred both employability and job skills training at the high school level. To improve vocational education, manufacturers recommended teaching basic skills and initiating more postsecondary work experience. Suggestions for change included providing more postsecondary course offerings, increasing employer involvement in vocational education evaluation, and improving entry-skills training. Manufacturers disagreed with public funding for job placement programs and for vocational programs for nontraditional occupations. (The survey is appended. Conclusions appear in an executive summary.) (YLB)

study, facilities for disabled students, native studies, and study opportunities for senior citizens. (SW)

Utilizing Vocational Education to Improve Productivity. Final Report.

Conserva, Inc., Raleigh, N.C.

Sep 1982 38p.; For related documents, see ED 219 527, ED 219 586, and CE 034 303-312.

Sponsoring Agency: Office of Vocational and Adult Education (ED), Washington, DC.

Contract No.: 300-81-0352

EDRS Price - MF01/PC02 Plus Postage.

Language: English

Document Type: PROJECT DESCRIPTION (141)

Geographic Source: U.S.; North Carolina

Journal Announcement: RIEAPR83

The purpose of a project was to increase the use of vocational education as a means of improving productivity. This purpose was to be accomplished through a two-fold goal: enhancing vocational education responsiveness to technological change and promoting a heightened public- and private-sector awareness of vocational education as a mechanism for productivity improvement. Through a literature review, major new technologies with impact relevance for vocational education were identified. The next step, assessment of the programmatic implications of the new technologies identified, was accomplished by relying upon 37 experts in the field to write 56 working papers. They provided information on job skills and the vocational education equipment and facilities necessary to teach those skills. Project staff prepared a monograph on the role of vocational education in productivity improvement, a paper on the role of state vocational education agencies in productivity improvement, and productivity workshop materials. The 56 working papers were also developed into a series of 7 reports that are each devoted to 1 of the major vocational education program areas: agriculture, distribution, health, home economics, office, technical, and trade and industrial. (A copy of the dissemination plan is provided.) (YLB)

HIGH TECHNOLOGY AND EMPLOYMENT

Looking for Talent to Tell High Tech's Story.
Anon
Business Week, No.2839, April 23, 1984, P. 31., Journal.

The high tech explosion has caught the country short of trained public relations workers. People who can decipher sophisticated new products, understand the marketplace and communicate are rare. Entry level salaries are rising and recruiters are having a field day.

DESCRIPTORS: High Technology; Public Relations; Employee; Employment Opportunity; 0433; 0255; 0958; 1476

High-Tech Perks: Benefits in the Silicon Valley.
Tom, P.
National Underwriter - Property & Casualty Insurance, Vol.88, No.13, March 30, 1984, P. 40-41., Tabloid.

The Silicon Valley in California was the location of a unique corporate development. The electronic industry settled there and competition for qualified employees was so fierce that employers offered employee benefits as tempting perquisites. Low deductibles and low-cost health care benefits are examples of the many perks offered. The employees developed a sense of entitlement that made them view the most desirable benefit packages as average. As the electronic industry levelled off and corporations began to revise and control the costs of their benefits, the Silicon Valley has remained innovative in employment benefits.

DESCRIPTORS: High Technology; Benefits; Perquisites; California; Electronic Industry; Employee Benefits; Health Care; Corporate Growth; Competition; Employee; Examples; Employment; Corporations; 0433; 1057; 0158; 1190; 0295; 0475; 0194; 1335; 0498; 0958; 1501; 0115; 0675

High Technology Today and Tomorrow: A Small Slice of the Employment Pie.
Riche, R.W.; Hecker, D.E.; Burgan, J.U.
Monthly Labor Review, Vol.106, No.11, Nov. 1983, P. 50-58., Journal.

An analysis of employment in high-technology indicates that such employment increased faster than average industry growth during the 1972-82 period. High tech industries accounted for a relatively small proportion of all new jobs nationwide. Six out of ten high tech jobs are located in the ten most populous states. States with relatively high proportions of employment in high tech industries are small. Through 1995, employment in high tech industries is projected to grow somewhat faster than in the economy as a whole. High tech industries will account for only a small proportion of new jobs through 1995. Scientific and technical workers will account for only six per cent of all new jobs through 1995. Available statistics and projections indicate that the future bulk of employment expansion will take place in non-high tech fields.

DESCRIPTORS: Tables; Employment Opportunity; High Technology; Maps; Science; Technology; Economic Growth; Statistics; Demographic Analysis; 2256; 1476; 0433; 2402; 0689; 0433; 0311; 0436; 1015

The future of rural technology.
McHale, Jim
Countryside v63 p32(3) June 1979
CODEN: COUSB
por
DESCRIPTORS: farm bwnership-forecasts; soil stabilization-technique; agriculture and politics-forecasts

High Tech's Workforce.
Adams, J.M.
New England Business, Vol.4 No.16, Oct. 4, 1982, P. 14-19., Journal.

It is believed that the future of the high tech industry in New England is dependent upon the needed skills being readily available in that geographic area. To maintain a large pool of technically skilled people, the educational facilities must teach those things which will be in high demand in the employment field. Since the availability of skilled personnel attracted so many companies to the region, cooperation between them and the educational facilities may help insure continued growth in New England's high tech industry.

DESCRIPTORS: Employment; High Technology; Education Requirements; Employment Opportunity; 0115; 0433; 2062; 1476

High Tech Comes to Temporary Help

Freudberg, Frank

Words v13n2 PP: 28-30,39 Aug/Sep 1984 ISSN: 0164-4742 JRNL CODE: WRD

DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 4 Pages

AVAILABILITY: ABI/INFORM

As the demand for workers skilled in such office automation functions as word processing increases, serious worker shortages have become evident. To help overcome this problem, services that provide temporary personnel have begun to train specialists in automated skills. Currently, some 3 million electronic workstations are in place in the US, and that number is expected to rise to 17.5 million by 1990. Thus, the shortage of skilled operators is not likely to improve much. Temporary employment services have had to develop special training programs to meet this challenge. One of these is Skillware, which was developed by Manpower Inc. Skillware is an on-screen tutorial that guides trainees through the functions of several word processing systems. Other companies feel it's better to recruit experienced word processing professionals. Kelly Services Inc. used a word processing simulator developed by Kee Inc. The Kee simulator provides information about the operator's skills, including inputting, formatting, and editing. Numerical scores are shown at the end of the test. Kee also provides cross training for those who can only operate one type of word processor.

DESCRIPTORS: High; Technology; Temporary employment; Employment agencies; Word processing; Skills; Support personnel

CLASSIFICATION CODES: 8300 (CN=Service industries not elsewhere classified); 6100 (CN=Human resource planning)

Getting High on Technology

Slater, Courtenay

American Demographics v5n11 PP: 40-41 Nov 1983 ISSN: 0163-4089 JRNL CODE: ADE

DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 2 Pages

AVAILABILITY: ABI/INFORM

High technology has been touted for the value of the new products and services that it offers, and also as a primary source of new jobs. Employment in the areas of computers, electronic components, and scientific instruments manufacture doubled during the 1960s and 1970s, while total manufacturing employment increased less than 25%. However, manufacturing is a small and decreasing share of total employment and provides less than one job out of 5. One definition of technological intensity is based on spending for research and development (R&D). For 11 US industries, R&D spending is higher than 3% of sales, while the average is 2%-2.5%. The 11 industries combined provide just 20% of total US manufacturing employment. The high-tech industries have significant potential to create new jobs, but this potential should be kept in perspective. Some 20 million jobs were created in the 1970s, but only 400,000 of these were in high-tech manufacturing.

A Quest for High-Tech Ventures

Anonymous

Chemical Week v134n21 PP: 14-16 May 23, 1984 CODEN: CHWKA9 ISSN: 0009-272X JRNL CODE: CEM

DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 3 Pages

AVAILABILITY: ABI/INFORM

The Thomas Alva Edison Program, a $32-million state program to attract high-technology industrial enterprises to Ohio, will be launched in 1984. The program's uniqueness lies in the opportunity to have pioneering research and development (R&D) work done on an economical basis in Ohio universities and colleges. A major cornerstone of the program, the Polymer Institute, is a joint venture of the University of Akron and Case Western Reserve University. It will be one of 4-6 R&D organizations to be established as advanced technical centers. Projects undertaken by the university/business partnerships will be divided into: 1. early-stage research to assess the economic feasibility of an idea, 2. advanced applied research, and 3. searches for innovative technology. Feasibility projects will be eligible for grants of up to $50,000 and applied research grants will reach to $250,000. If the applied research yields a winner, the grant becomes an interest-bearing loan to be repaid to the state treasury. In addition to a one-year legislative allotment of $24 million for the R&D centers, several rubber companies have pledged a total of $7 million to the Polymer Institute. Table.

DESCRIPTORS: Ohio; Economic development; Programs; High; Technology; Incentives; Location of industry; R&D; Chemical industry; Employment; Economic conditions

CLASSIFICATION CODES: 1120 (CN=Economic policy & planning); 5400 (CN=Research & development)

Markets, Bureaucracies and Groups in the Information Society: An Institutional Appraisal of the Impacts of Information Technology

Ciborra, Claudio U.

Information Economics & Policy (Netherlands) v1n2 PP: 145-160 1983 ISSN: 0167-6245 JRNL CODE: IEP

DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 16 Pages

AVAILABILITY: ABI/INFORM

A new analytical framework is described through which one can explore the impact of information technology on

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organizations. Information technology will have widespread impacts on the quantitative and qualitative dimensions of employment. Information technology has the following potential effects: 1. It decreases the cost of transactions. 2. It makes an organization more efficient. 3. It changes organizational patterns. A sample of Italian companies that applied technological innovations between 1978 and 1980 yielded empirical data that support the following conclusions: 1. Hypointegrated organizations undergo an integration process. 2. Market forms tend to strengthen and expand. 3. The bureaucracy becomes highly turbulent. The empirical data show how computerization changes organizational patterns according to efficiency considerations. Tables. Chart. References.

DESCRIPTORS: Information; Technology; Impacts; Productivity; Employment; Organizational; Structure; Office automation

CLASSIFICATION CODES: 2320 (CN=Organizational structure); 9130 (CN=Experimental/Theoretical); 1130 (CN=Economic theory)

Can High Tech Save the Great Lakes States?

Browne, Lynn E.

New England Economic Review (Federal Reserve Bank of Boston) PP: 19-33 Nov/Dec 1983 CODEN: NWEEAP ISSN: 0028-4726 JRNL CODE: NEE

DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 15 Pages

AVAILABILITY: ABI/INFORM

Increased employment in high-technology industries will provide only a portion of the solutions for the current economic difficulties of the Great Lakes states - Illinois, Indiana, Michigan, Ohio, and Wisconsin. Bureau of Labor Statistics figures show that while total manufacturing employment fell 10 1/2% in the Great Lakes region from 1979 to 1982, high-technology employment fell less than 1%. Employment in core high-tech industries such as drugs, office equipment, and computing machines increased 9%. However, nonmanufacturing employment increased 21% from 1973 to 1979 and 3% from 1979 to 1982. Nonmanufacturing wage and salary employment increased by more than 14 million from 1973 to 1982 while high technology increased by less than a million. Given these trends and the absence of a high proportion of professionals and technicians in the Great Lakes' region, increased employment in high-tech industries may not occur. Other factors pointing to this include: 1. an educational level below the national average, 2. migration of college graduates to other parts of the US, 3. the absence of an existing large high-technology base, and 4. high production worker wages and a high degree of unionization. Tables. Maps. References.

DESCRIPTORS: Great Lakes; Recessions (ECON); Impacts; High; Technology; Employment; Economic growth; Workforce planning; Wages & salaries; Industrial development

CLASSIFICATION CODES: 1110 (CN=Economic conditions & forecasts)

Route 128: The Development of a Regional High Technology Economy

Dorfman, Nancy S.

Research Policy (Netherlands) v12n6 PP: 299-316 Dec 1983 CODEN: REPYBP ISSN: 0048-7333 JRNL CODE: RPO

DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 18 Pages

AVAILABILITY: ABI/INFORM

This study of the Massachusetts high-technology economy, conducted at the Center for Policy Alternatives (CPA) at the Massachusetts Institute of Technology (MIT), focuses on the rapid growth in the state's high-tech sector toward the end of the 1970s and its relationship to earlier trends. An area near Boston's Route 128 has become a world center of high tech, employing over 250,000 people. Massachusetts' high-tech development has been largely indigenous and spontaneous. The reasons for this growth include: 1. the state's distinguished universities and research laboratories, 2. an inherited technological infrastructure, 3. the importance of agglomeration externalities, and 4. a local firm that became the world's leading manufacturer of minicomputers. The growth of California's Silicon Valley as compared to that of Massachusetts reveals that the 2 areas grew up technologically for similar reasons. Tables. References.

DESCRIPTORS: High; Technology; Growth; Massachusetts; Trends ; Studies; Employment; Statistical data; Labor supply; Research; Technological; Infrastructure (ECON); Manyindustries

CLASSIFICATION CODES: 5400 (CN=Research & development); 9140 (CN=Statistical data)

High Technology Today and Tomorrow: A Small Slice of the Employment Pie

Riche, Richard W.; Hecker, Daniel E.; Burgan, John U.

Monthly Labor Review v106n11 PP: 50-58 Nov 1983 CODEN: MLARAO ISSN: 0098-1818 JRNL CODE: MLR

DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 9 Pages

AVAILABILITY: ABI/INFORM

The use of scientific and technical employees, expenditures for research and development, and the sophistication of industrial products were used as criteria to develop definitions of high-technology industries for an analysis of employment trends in these industries. Through 1995, employment in high-tech industries is expected to increase somewhat more rapidly than in the overall economy, but even using a broad definition of high tech, such jobs will account for just a small proportion of new jobs. However, the high-tech industries do comprise a substantial proportion of new employment in some states and communities. Employment in high-tech industries increased more rapidly than average industry growth between 1972 and 1982. Some 60% of high-tech jobs are located in the 10 most populous states. Maps.

(cont. next page)

Industrial equipment; Economic development; Buy sell agreements
CLASSIFICATION CODES: 1110 (CN=Economic conditions & forecasts); 8660 (CN=Metalworking industry); 9170 (CN=Non-US)

High Technology and Business Services
Browne, Lynn E.
New England Economic Review (Federal Reserve Bank of Boston) PP: 5-17 Jul/Aug 1983 CODEN: NWEEAP ISSN: 0028-4726 JRNL CODE: NEE
DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 13 Pages
AVAILABILITY: ABI/INFORM
Since the mid-1970s, New England's employment growth rate has matched the nation's, despite the region's substantially slower population growth. Strong gains in the manufacturing sector accounted for the surprising performance. The high-technology industries have been the fastest growing among the manufacturers, involving such industries as computers, electronics, and various forms of instrumentation. However, an overlooked source of new employment is the service industries, particularly those in business service employment. In New England, business service has not only surpassed the employment growth rate nationally, but also that of most high-tech manufacturing industries. Business service employment, of which computer and data processing services are a part, is benefiting greatly from the increasing accessibility to computers. By the end of 1982, computer services employed roughly 2% of the total service workforce, a substantial number when the diversity of the US industrial base is considered. Tables. Maps. Appendix. References.
DESCRIPTORS: High; Technology; Manufacturing; Data processing; Service industries; Computer industry; Management consultants; Employment; Statistical data; Wages & salaries
CLASSIFICATION CODES: 8300 (CN=Service industries not elsewhere classified); 8600 (CN=Manufacturing industries not elsewhere classified); 9140 (CN=Statistical data)

An Introduction to High Tech/Prospects for High Tech in Illinois
Schnell, John F.; Junkus, Joan C.
Illinois Business Review v40n3 PP: 6-9,12 Jun 1983 CODEN: ILBRAJ ISSN: 0019-1922 JRNL CODE: ILB
DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 5 Pages
AVAILABILITY: ABI/INFORM
The varying perceptions of high technology warrant a closer examination of what this phenomenon is and is not. There is little concurrence on the definition of a high-tech industry. The US Bureau of Labor Statistics bases its classification of these industries on higher than average research and development expenditures and numbers of technical employees. High-tech firms include manufacturers of drugs, computers, and electronic components. Although the high-tech sector will produce new jobs, growth in employment will not equal growth in production. There is doubt about whether the US will produce enough technically trained workers. Substantial federal support of training programs appears unlikely in the near future. Illinois has the potential to become a leader in the new high-tech industries, with its large population, established infrastructure, several major universities, and a number of local economic development agencies that are aware of the importance of attracting a new type of industry to the state. Graphs. Tables.
DESCRIPTORS: High; Technology; Industries; Employment; Education; Economic development; Industrial development; Incentives; Location of industry
CLASSIFICATION CODES: 1110 (CN=Economic conditions & forecasts)

Getting Ready for the Jobs of the Future
Cetron, Marvin J.
Futurist v17n3 PP: 15-22 Jun 1983 CODEN: FUTUAC ISSN: 0016-3317 JRNL CODE: FUS
DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 8 Pages
AVAILABILITY: ABI/INFORM
Significant shifts will occur in employment patterns in the future job market. These changes will affect how people work and how people are educated and trained for employment. Unemployment will continue to be a problem, and by 1990, 8.5% unemployment will be considered full employment. Jobs that will be increasingly important in the future include energy technician, housing rehabilitation technician, and hazardous waste management technician. Competent teachers must be attracted to vocational education to assure that that system offers the education and training needed by the labor force of the future. Status and salaries must both be improved for this to occur. If the US is to hold on to the lead it now enjoys in technology, there must be increased support for mathematics and science, with higher standards for math, science, and computer literacy in high school. Education must also prepare people for change. Societal changes will require changes in skills and knowledge for productivity and satisfaction. Increased levels of cognitive skills must be learned as early as possible. The first step in preparing for employment patterns of the future is to encourage skill upgrading among the unemployed; the 2nd step is a retooling of the education system. Charts.
DESCRIPTORS: High; Technology; Labor market; Employment; Unemployment; Foreign; Competition; Job openings; Vocational education; Training; Educators
CLASSIFICATION CODES: 1110 (CN=Economic conditions & forecasts); 6200 (CN=Training & development)

HIGH TECHNOLOGY AND FOREIGN TRADE

Can China Become a High-Tech Powerhouse

Anonymous

Business Week n2846 PP: 154 B-G Jun 11, 1984 CODEN: BUWEA3 ISSN: 0007-7135 JRNL CODE: BWE

DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 4 Pages

AVAILABILITY: ABI/INFORM

The Peoples Republic of China is determined to become a commercial powerhouse, if not a world leader, in high technology. The country had accumulated $14.3 billion in foreign exchange reserves by the end of 1983, enabling it to import vast quantities of equipment, computers, and electronic components. The Electronics Ministry hopes to produce $12.5 billion worth of electronics hardware by 1990. Although the Chinese admit they are currently 15-20 years behind the West, they believe they can move ahead rapidly if they can tap the US or Japan for relatively advanced manufacturing expertise. Chinese officials say their top priority is to buy equipment for improving domestic manufacturing capabilities. Despite a Reagan Administration shift in policy that calls for relaxed controls on high-tech exports to China, the Chinese seem more willing to turn to Japan and Germany for hardware and expertise. The recent US crackdown on illegal exports of its technology has also complicated US-China trade.

DESCRIPTORS: Peoples Republic of China; Electronics industry : High; Technology; Markets; Trends; Imports; Computer industry; International trade

CLASSIFICATION CODES: 9180 (CN=International); 1300 (CN=International trade & foreign investment); 8650 (CN=Electrical & electronics industries); 8651 (CN=Computer industry)

International Technology Transactions and the Theory of the Firm

Davidson, W. H.; McFetridge, Donald G.

Jrnl of Industrial Economics (UK) v32n3 PP: 253-264 Mar 1984 CODEN: JIEOAF ISSN: 0022-1821 JRNL CODE: JIE

DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 12 Pages

AVAILABILITY: ABI/INFORM

The circumstances under which it is advantageous to internalize international transactions involving technology are investigated using the theory of the firm, which holds that the choice between intrafirm and market exchange will be based on their relative costs. Data are obtained from a sample of 1,376 internal and arm's length (market) transactions involving high-technology products carried out by 32 US-based multinational organizations between 1945 and 1975. Several alternative means of holding country effects constant are examined, including: 1. employing the past relative frequency of internal transfers to each receiving country as an extra model variable, 2. permitting the intercept term to vary across countries or groups of countries, and 3. estimating the model for individual countries. Systematic differences exist in the characteristics of intrafirm and market technology transactions. These differences are, for the most part, consistent with those implied by the theory of the firm. Tables. Equations. References.

DESCRIPTORS: Economic theory; International trade; Technology transfer; Factors; Economic models; Transactions; Methods

CLASSIFICATION CODES: 1130 (CN=Economic theory); 9130 (CN=Experimental/Theoretical); 1300 (CN=International trade & foreign investment)

Industrial Policy and International Competition in High Technology

McKenna, Regis; Borrus, Michael G.; Cohen, Stephen S.

California Mgmt Review v26n2 PP: 15-32 Winter 1984 CODEN: CMNRAK ISSN: 0008-1256 JRNL CODE: CMR

DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 18 Pages

AVAILABILITY: ABI/INFORM

Japanese competitive strategies have served to block capital formation by US high-technology firms. Japanese high-tech firms, under government protection, have experienced more readily available and cheaper sources of capital for production investment than US firms. Japanese firms have avoided high research and development (R&D) outlays through licensing agreements to acquire foreign technology, freeing them to pursue manufacturing innovations for the production of high-quality, low-cost products. In addition, the Japanese government has protected its domestic market from US entry. If US high-tech firms are to be more competitive, they must be encouraged to invest in manufacturing technology by an industrial policy which provides tax credits for R&D expenditures. Technology licensing agreements with Japan must be subject to the condition that US firms are granted access to Japanese domestic markets. Graphs. Tables. Appendix. References.

DESCRIPTORS: Industrial; Policy; R&D; High; Technology; Competition; Capital formation; International trade

CLASSIFICATION CODES: 5400 (CN=Research & development); 1120 (CN=Economic policy & planning); 1300 (CN=International trade & foreign investment)

Market Power of the Firm and International Transfer of Technology: A Historical Excursion

Dunning, John H.

International Jrnl of Industrial Organization (Netherlands) v1n4 PP: 333-351 1983 CODEN: IJIODY ISSN: 0167-7187 JRNL CODE: IJI

DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 19 Pages

AVAILABILITY: ABI/INFORM

Some ways in which the international transfer of technology may be affected by the economic power of the transmitting

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enterprises are examined. Power is defined as the economic leverage firms have over their own (and other firms') behavior. It is proposed that multinational corporations (MNC) deploy transaction power to influence the international transfer of technology in precisely the same way as they may affect the disposition of a given asset. Five phases of technological transfer expansion broadly corresponding to the major economic thrusts of the last 150 years are examined. It is concluded that a firm's economic power depends on the uniqueness of the assets it possesses, the number and kind of transaction economizing activities it undertakes, and the externalities that emerge from them. The way the power is exercised depends on the goals of the enterprise, the tactics it adopts to accomplish these goals, and the extent to which government fiat is able to constrain its behavior. Both the origin and use of economic leverage will depend on country, product, and firm-specific characteristics. References.

DESCRIPTORS: Technology transfer; Economic rent; Multinational corporations; International trade; Foreign investment

CLASSIFICATION CODES: 1300 (CN=International trade & foreign investment); 9510 (CN=Multinational corporations)

The Engineering and Construction Service Industry - Define U.S. Trade Policies

Tappan, D. S.

Vital Speeches v50n9 PP: 279-282 Feb 15, 1984 CODEN: VISPAG ISSN: 0042-742X JRNL CODE: VSP

DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 4 Pages

AVAILABILITY: ABI/INFORM

When an imbalance of imports over exports eventually led to a dangerous trade deficit, the US was forced to realize that foreign commerce must be a 2-way street. No nation is wholly self-sufficient in the modern world. It is clear that the role of exports in the US economy today, and in the future, is of vital importance. The engineering and construction (E&C) industry has an important role to play in international trade or increasing exports. The E&C industries make a significant contribution to the domestic economy, making a 6% direct contribution to US employment and contributing 7.5% to the gross national product in 1983. The E&C service industry also offers benefits to developing nations, such as the Association of Southeast Asian Nations (ASEAN). In addition, E&C firms have an economic impact on their host countries and are partners in developing energy resources. However, exporters face numerous constraints and a rising wave of protectionism, which must be overcome and dealt with through clear US trade policies.

DESCRIPTORS: International trade; Engineering; Construction industry; Exports; Trade policy; Technology transfer

CLASSIFICATION CODES: 1300 (CN=International trade & foreign investment)

Why Not Sell Technology to the Russians?

Goldman, Marshall

Technology Review v87n2 PP: 70-74,76-80 Feb/Mar 1984 CODEN: TEREAU ISSN: 0040-1692 JRNL CODE: TCR

DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 10 Pages

AVAILABILITY: ABI/INFORM

As Western planners debate whether to sell technology to communist countries', communist policymakers are trying to decide whether they actually should buy such technology. The crucial unknown factor that complicates both debates is just how helpful technology transfer is. Successful absorption of western technology by the Soviets could result in improved military capabilities and economic production. However, unsuccessful Soviet absorption of western technology is very expensive and sometimes causes more problems than it solves. Efforts to restrict trade are costly in terms of the loss of export earnings and increased tension between the US and its allies. Targets for trade restriction, therefore, must be selected carefully. The USSR likely will continue to seek imported technology to help in modernizing its economy, and some of this imported technology may have military implications as well. However, this possibility holds much less of a threat than some opponents of US-USSR trade have suggested. Graph.

DESCRIPTORS: International trade; US; USSR; Trade restrictions; Trade barriers; Technology transfer; Foreign policy; Trade policy

CLASSIFICATION CODES: 1300 (CN=International trade & foreign investment); 1120 (CN=Economic policy & planning)

Future Technological Work Culture: Part II

Harris, Philip R.

Leadership & Organization Development Jrnl (UK) v4n2 PP: 8-14 1983 ISSN: 0143-7739 JRNL CODE: LOD

DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 7 Pages

AVAILABILITY: MCB Publications Ltd., 198/200 Keighley Rd., Bradford, W. Yorkshire, England BD9 4JQ

The metaindustrial work culture is expected to continue to produce a host of new technologies that will produce change in society and in the way that sponsoring organizations function. The fields of microelectronics, information, and genetic technologies will transform the modern organization. Two important trends in this area are: 1. the internationalization of metaindustrial organizations which will operate beyond national jurisdictions, and 2. miniaturization will be a key emphasis on metaindustrial organizations. One way to obtain insight into the new directions in the metaindustrial work culture is to examine some of the markets that will attract its workers. Two product markets examined are the home communication centers

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and genetic engineering. Two geographic markets - the Pacific Rim and space industrialization - provide additional illustrations of the interconnections between the new technologies and culture. The metaindustrial work culture is characterized by: 1. openness to new ideas and possibilities, 2. innovation in working and solving problems, and 3. synergy in work, union, government, and community relations. References.

DESCRIPTORS: Organization development; Technological change; Predictions; Bio; Technology; Genetic engineering; International trade; Organizational behavior

CLASSIFICATION CODES: 2500 (CN=Organizational behavior); 5400 (CN=Research & development); 1300 (CN=International trade & foreign investment)

Licensing

Well, Martin

China Business Review v10n6 PP: 36-43 Nov/Dec 1983 ISSN: 0094-0089 JRNL CODE: CHB

DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 8 Pages

AVAILABILITY: ABI/INFORM

The Peoples Republic of China has expanded greatly the number of technology licensing agreements it has signed with foreign entities. New agreements on technology transfer involve a wide range of essential technologies. They also represent hundreds of millions of dollars. The Chinese eagerness to enter new deals has not necessarily been accompanied by alacrity in implementing them. The experience of foreign companies so far suggests that China can absorb licensed technology only slowly, at best, especially when the technology is not associated with a complete plant purchase. Delays and frustration are common. China still plans to impose very tough conditions on its licensing partners concerning payment, duration, company guarantees and obligations, and the re-export of licensed products. Even with the difficulties involved, licensing still offers firms enough real or projected return to keep them involved. Charts.

DESCRIPTORS: Peoples Republic of China; Licensing; Economic policy; Attitudes; Technology transfer; International trade; Trade agreements; US; Petroleum industry; Mining industry

CLASSIFICATION CODES: 9180 (CN=International); 1300 (CN=International trade & foreign investment)

Applicable Law and Dispute Settlement in the Transfer of Technology Code

Wilner, Gabriel M.

Jrnl of World Trade Law (UK) v17n5 PP: 389-396 Sep/Oct 1983 ISSN: 0022-5444 JRNL CODE: JWT

DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 8 Pages

AVAILABILITY: Journal of World Trade Law, 10 Hill View Rd., Twickenham, Middlesex, England TW1 1EB

The negotiation of the chapter of the Draft International Code of Conduct on the Transfer of Technology regarding the law applicable to transfer of technology transactions and the settlement of disputes is described. The negotiation has resulted in an informal draft of provisions as well as drafts introduced by regional groups of states representing developing countries, the developed countries of the Organization for Economic Cooperation and Development (OECD), and the socialist countries. The informal draft provisions are based upon the principle of freedom to choose applicable law for a contract. The regional groups agree on arbitration as a method of resolving disputes. There is an immediate need for code provisions calling for application of code standards by legislative, administrative, judicial, and arbitral decision makers, and calling for the creation of a decision-making process relating to arbitration. References.

DESCRIPTORS: Technology transfer; International trade; Trade negotiation; Arbitration; Codes; International; Law; OECD; Regulation

CLASSIFICATION CODES: 1300 (CN=International trade & foreign investment); 4310 (CN=Regulation)

The ITT Story

Brown, Chris

China Business Review v10n5 PP: 40-42 Sep/Oct 1983 ISSN: 0094-0089 JRNL CODE: CHB

DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 3 Pages

AVAILABILITY: ABI/INFORM

The recent agreement between International Telephone & Telegraph's (ITT) Belgian subsidiary, Bell Manufacturing Co. (BTM), and the China National Postal and Telecommunications Industry Corp. (PTIC) is the most promising indication of what could be possible under new, eased US export controls for China. The deal will be the first Peoples Republic of China (PRC) joint equity venture involving US software or semiconductor technology. Because of its magnitude and technological sophistication, the ITT deal is important as a model of the terms other companies may face as they enter the evolving PRC market. The ITT deal is likely to establish a precedent and its contractual terms are likely to become fairly standard. As the way opens for more technology transfer, US companies will find that Chinese counterparts are very interested in joint ventures.

DESCRIPTORS: Peoples Republic of China; ITT; International trade; Joint ventures; Technology transfer; Telecommunications industry; Case studies

CLASSIFICATION CODES: 9110 (CN=Company specific); 8330 (CN=Broadcasting & telecommunications); 9170 (CN=Non-US); 1300 (CN=International trade & foreign investment)

Transferring Technology to the Small Manufacturing Firm: A Study of Technology Transfer in Three Countries

Allen, Thomas J.; Hyman, Diane B.; Pinckney, David L.

Research Policy (Netherlands) v12n4 PP: 199-211 Aug 1983 CODEN: REPYBP ISSN: 0048-7333 JRNL CODE: RPO

DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 13 Pages

AVAILABILITY: ABI/INFORM

General managers from small manufacturing firms in Ireland, Spain, and Mexico were interviewed to assess how small firms acquire ideas for innovations and what technology is used in implementing them. The interviews identified over 100 instances of technological change in the firms surveyed. Innovative ideas were generally acquired outside the firm through informal contacts with other firms in the industry, frequently competitors. Almost half of the innovative ideas were obtained from foreign firms. Universities, research institutes, and published literature were infrequent sources for innovative ideas. Product innovations tended to be based on domestic technology, while process innovations generally required foreign technology. Subsidiaries of multinational firms acquired most of their technology from parent firms; however, acquisition was dependent upon the planned technological change matching the corporate goals of the multinational, resulting in subsidiary firms having less overall access to foreign technology than domestic firms. Tables. References.

DESCRIPTORS: Technology transfer; Studies; Ireland; Mexico; Spain; Manufacturing; Innovations; International trade; R&D; Small business

CLASSIFICATION CODES: 1300 (CN=International trade & foreign investment); 5400 (CN=Research & development); 9520 (CN=Small business); 8600 (CN=Manufacturing industries not elsewhere classified)

The Imperfect Market for Technology Licenses

Caves, Richard E.; Crookell, Harold; Killing, J. Peter

Oxford Bulletin of Economics & Statistics (UK) v45n3 PP: 249-267 Aug 1983 ISSN: 0305-9049 JRNL CODE: OXB

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AVAILABILITY: ABI/INFORM

International transfers of technology between firms have created much discussion as an issue of economic policy. Imperfections in the market for technology licenses are examined. Licensing agreements result from a basis on costs and uncertainties of contractual agreements between opportunistic parties. Surveys are conducted of licensors and licensees, concentrating on 2 classes of hypotheses about imperfections in the market: 1. Licensees take part in a market for specific advantage. 2. Each license agreement is viewed as a pareto-optimal deal. Analysis indicates that license agreements fail to capture the full rent for the licensor, enabling the licensee to emerge from the transaction in a stronger position. Technological licenses are becoming more important in international commerce. Generally, both the source and recipient countries lose if technology transfers are diverted toward agreements that otherwise would have occurred through joint ownership. Tables. References.

DESCRIPTORS: Technology transfer; Technology; Licensing; Studies; Surveys; Diversification; Product development; Imperfect; Markets; International trade; Economic theory

CLASSIFICATION CODES: 5400 (CN=Research & development); 1130 (CN=Economic theory); 1300 (CN=International trade & foreign investment); 9130 (CN=Experimental/Theoretical)

Trade Between Developing Countries, Technology Transfers and Employment

Sabolo, Yves

International Labour Review (Switzerland) v122n5 PP: 593-608 Sep/Oct 1983 CODEN: ILREDT ISSN: 0020-7780 JRNL CODE: BOU

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An attempt is made to answer the questions: 1. How much has trade between developing countries (TDC) grown over the last 10 to 15 years? 2. What are the quantitative and qualitative characteristics of technology transfers between developing countries and what part does TDC play in them? 3. Does TDC create more or fewer jobs than exports from developing to industrialized countries, or does it make no difference to employment? Trade between developing countries, modest in volume, is one of the most dynamic elements in world trade and in the growth of the countries of the South. South-South industrial technology exports offer advantages, as they are better adapted to the needs of developing countries, from the standpoint both of factor availabilities and of the concepts of organization and work habits of these countries. South-South trade generates fewer jobs than the same volume of exports to the North. Tables. References.

DESCRIPTORS: International trade; LDCs; Technology transfer; Employment; Exports; Heckscher Ohlin principle; Economic theory

CLASSIFICATION CODES: 1300 (CN=International trade & foreign investment); 1130 (CN=Economic theory); 9130 (CN=Experimental/Theoretical); 9170 (CN=Non-US)

MITI's Technopolis Project
Davis, Neil W.
Japan Marketing/Advertising (Japan) v2n2 PP: 40-41 Spring 1984 ISSN: 0386-6076 JRNL CODE: DJM
DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 2 Pages
AVAILABILITY: ABI/INFORM
Japanese knowledge-intensive industries are almost totally confined to the Tokyo and Osaka metropolitan areas, but a new government-sponsored project is aimed at decentralizing the next generation of knowledge-based work. In 1980, the Ministry of International Trade and Industry (MITI) proposed the construction of a few ''technopolis'' projects, or ''high-technology towns.'' Over 80% of the prefectural governments responded with follow-up proposals for candidate technopolis sites. In February 1984, MITI designated 14 candidates, each of which, if they meet certain conditions, will be entitled to government tax privileges, low interest loans, and subsidies to attract high-tech industries to outlying areas. The technopolis project is largely an experiment in future demographic trends in living and working needs. Incentives will be provided by MITI to lure the specialists away from the cities, and foreign companies are being courted as potential participants in many of the individual development plans. Map.
DESCRIPTORS: High; Technology; Industry; MITI-Japan; Projects; Site selection; Decentralization; Rural development; Relocating personnel; Problems; Economic impact; Local government; Foreign investment; Incentives
CLASSIFICATION CODES: 1120 (CN=Economic policy & planning); 8651 (CN=Computer industry); 9170 (CN=Non-US)

Information Technology in Rural Emergency Management
Morentz, James W.
Information Society v2n2 PP: 131-143 1983 CODEN: INSCD8 ISSN: 0197-2243 JRNL CODE: INS
DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 13 Pages
AVAILABILITY: ABI/INFORM
The social and economic life of rural communities continually is jeopardized by emergency situations caused both by natural events and human activities. Advances in information technology are making it possible for rural emergency management teams to prepare effectively for and respond to disasters. In Minnesota, microcomputers have been used to aid rural communities in managing and deploying emergency resources. Several states have implemented 2-way cable television links to local emergency services, such as fire stations, police stations, and emergency medical services. Arizona has developed an emergency satellite communications system to coordinate state and county emergency operations. These applications have been based on commercially adaptable technologies. However, widespread use of information technology will require the development of specific emergency management applications.
DESCRIPTORS: Information; Technology; Rural; Emergencies; Security systems; Protective services; Applications
CLASSIFICATION CODES: 5200 (CN=Communications & information management); 5140 (CN=Security)

We Are Not Alone: A Sample of International Policy Challenges and Issues
Goodman, S. E.; Kelly, M. R.
Information Society v2n3/4 PP: 249-268 1984 CODEN: INSCD8 ISSN: 0197-2243 JRNL CODE: INS
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AVAILABILITY: ABI/INFORM
In the face of increased international competition, the US information industry has become critical of government policies for promoting trade in information technology and services. However, the formulation of trade policies for specific industries must be undertaken in consideration of the complex interrelationships among military, political, and economic factors. The re-export by foreign nations of US-originated technology illustrates how government policymakers have failed to effectively analyze the technological status of other nations, their policy supports for information technology, and how these affect US policy effectiveness. Trade policies must be formulated on the basis of extensive, long-term, continuous analysis of data on foreign policies and technological capabilities. Since these data are not readily available, highly trained analysts are needed to track international developments. However, such analysts are in critically short supply in the US. References.
DESCRIPTORS: Computer industry; Telecommunications industry; High; Technology; International trade; Trade relations; Trade development; Problems; Trade policy
CLASSIFICATION CODES: 8650 (CN=Electrical & electronics industries); 9180 (CN=International); 1300 (CN=International trade & foreign investment)

Information and Rural Development
Storm, Bonnie L.
Bulletin of ASIS v8n4 PP: 25-29 Apr 1982 CODEN: BASICR ISSN: 0095-4403 JRNL CODE: BAS
DOC TYPE: Journal Paper LANGUAGE: English LENGTH: 5 Pages
AVAILABILITY: ABI/INFORM
Information plays a critical part in attempts to upgrade life in the remote parts of developing nations. Less developed countries often have problems with technology because it is: 1. beyond the capacity of a country to absorb and integrate, 2. above the level of technical expertise of the broader work force, or 3. highly capital intensive. Two similar yet distinct trends have resulted in rural development as a result of these shortcomings: appropriate technology and human development. Communication techniques that seem to have
(cont. next page)

the most promise in rural development are cassette tapes and video, but none of these technologies and approaches will be effective without the involvement of people. Participation of the recipients is important in all stages of information dissemination projects - designing, planning, implementation, and follow-up. Information that encourages change in work processes, health practices, or family life patterns will have greater success if it is founded on a knowledge of traditional cultures.

DESCRIPTORS: Information; Rural development; Technology; Education

CLASSIFICATION CODES: 5200 (CN=Communications & information management)

Science and Technology in United States Foreign Trade

Sveikauskas, Leo

Economic Jrnl (UK) v93n371 PP: 542-554 Sep 1983 CODEN: ECJOAB ISSN: 0013-0133 JRNL CODE: ECJ

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Economists generally believe that modern science and technology is a central factor in the comparative advantage of advanced industrial nations in foreign trade. However, most data on the subject are based on cross industry regressions which do not provide a valid indication of factor abundance. The role of different elements of technology is studied in data for 1967 US international trade. The roles of research and development and of scientists and engineers, along with several other elements of advanced technology and innovation, are investigated. Factor abundance is defined as a country's share of the world amount of a resource. A model is developed to indicate factor abundance. Results provide support for the hypothesis that science and technology, rather than capital formation and human skills, are fundamental economic advantages of industrialized nations. Equations. Table. References.

DESCRIPTORS: Science; Technology; Economic theory; International trade; Production factors (ECON); R&D; Comparative advantage (COM); Industrialized nations

CLASSIFICATION CODES: 5400 (CN=Research & development); 1300 (CN=International trade & foreign investment); 9130 (CN=Experimental/Theoretical); 1130 (CN=Economic theory)

DOC TYPE: Journal Paper LANGUAGE: English

AVAILABILITY: ABI/INFORM

Recent shifts in buying power and massive development programs have shifted the telecommunications market somewhat. The demand for telecommunications facilities in the areas of low population density and low income is increasing. The costs for the connection of isolated communities into regional networks may be equalized by the use of low cost ground stations and high capacity satellite transponders. The use of solar power will free the telephone company from one of its restraints, the siting of communications equipment only where power is available. Recent advances in semiconductor technology have resulted in reductions in weight, size, and power requirements. These reductions have drastically lowered the costs associated with the housing, storage, installation, and power for telecommunications equipment. Chart.

DESCRIPTORS: Rural; Telecommunications systems; Technology; Markets; Satellite communications; Solar energy; Digital transmission (TC)

CLASSIFICATION CODES: 8330 (CN=Broadcasting & telecommunications); 1500 (CN=Energy/Environment)

New Technology Offers Economical Services

Lloyd, L. D.

Telephony v196n11 PP: 36-42 March 12, 1979 CODEN: TLPNAS ISSN: 0040-2656 JRNL CODE: TPH