

Trend Report 2005

All selected source articles chosen for this trend summary are more recent than July 1, 2004. These selected articles are representative of hundreds of original articles and studies reviewed by Future Work staff. The opinions stated in the articles are those of the various source documents and not the view or statement of *Minnesota Future Work*.

Introduction

The trends included in the 2005 Future Work Report were selected from a wide possibility of trends observed in our economy and society. As a filter we used the following selection criteria:

1. Trends that have a direct impact upon higher education in Minnesota.
2. Industries and or occupations that have significantly occupational demand and or change.
3. Trends in the ISEEK occupational cluster categories.
4. Trends that reflect significant changes within the workforce or workplace.

Trend Summary

The following trends were selected for the Future Work 2005 Trend Report.

Agriculture, Food and Natural Resources

Agriculture focuses on the production of agricultural goods including food, fiber, wood products, horticultural crops, and other plant and animal products, horticulture and landscaping services, conservation of land and water resources, mining operations, and environmental management services. Agriculture continues to experience innovation in bioscience and technology.

- Many new jobs generated in agriculture today, are not on farms but located in agri-business, agencies, offices and universities offices throughout America.
- Because of the growth in biosciences, millions of jobs will be created in agricultural services. This includes careers in animal and plant research, food scientists, commodity brokers, nutritionists, agricultural journalists, bankers, market analysts, sales professionals, food processors, forest managers and wildlife specialists.

Architecture and Construction

Architecture and construction which focus on the design and maintenance of man-made structures includes designing, planning, managing, building and maintaining the built environment such as servicing buildings, roadways, and bridges. Several occupations are in high demand.

- Construction has reasons to be optimistic. Openings are created as older workers retire and the construction industry continues to move ahead at a steady pace.
- The opportunities for men and women in such fields as architecture and plumbing are numerous.
- Workers with experience and training in various construction trades can anticipate many job opportunities.

Business, Management, Finance and Administration

Planning and management includes the following areas: administrative support, information processing, accounting, human resources and other related management support services. Business majors face a very optimistic employment picture.

- A huge demand for accountants and auditors is the result of Sarbanes-Oxley federal legislation.
- A shortage of skilled workers is developing.
- Based on surveys of graduates, students that have an associate, bachelor or master's degree that enter the job market will face an expected 20 percent increase in hiring.

Education and Training.

Occupations in this category provide education, training and other related learning support services, such as assessment, and library and information services. Education continues to provide numerous professional employment opportunities, particularly in the rapidly growing for-profit sector.

- To fill the numerous teaching vacancies, as many as 2.2 million teachers are needed between 2000 and 2010.
- Recent Census Bureau data show that 45 percent of librarians will reach retirement age by 2010.
- The education area, including the corporate for-profit model, is the fastest-growing segment of the \$315.5 billion postsecondary market in North America.

Government

Government services which include governance, national security, foreign service, planning, revenue and taxation and local, state and federal level employment exhibited two important trends this year.

- In Minnesota, government has reduced the salary gap between men and women.
- Employment prospects for those looking for work involving security and law enforcement or public health face a very optimistic employment picture.

Health Sciences

Health sciences focus on providing diagnostic, therapeutic, informational and environmental and support services in health care, including biotechnology research and development. Most employers were attempting to cope with the nursing and staffing shortages and the application of new technology.

- In Minnesota it appears that the shortage may be easing because people returned to nursing.
- Information and medical technology are being used to make the work of medical professionals more efficient and to better serve the clients. It is being applied to every facet of medicine from paperless record keeping to high tech devices for home health care.

Hospitality and Tourism

Hospitality and tourism, including the marketing and operations of restaurants, lodging, recreation, attractions and tourism, is a growth industry. This is a major employer in Minnesota with some high needs for employees.

- Leisure and hospitality is the second fastest growing industry in Minnesota.
- The restaurant industry is the nation's largest employer outside government employment.
- Hotel management is a growth occupation.

Human Services

Within the rapidly growing human services area including family, social and related community services, many occupational growth areas are excellent. With the aging of the baby boom generation, health and human services are in demand.

- In the Government employment area, the Federal government is hiring many persons across its wide employment spectrum to replace retiring workers.
- Several of the new and emerging occupations, such as bill review nurse, adult protective services, and cheer workers, will be in Human Services.

Information Technology

Information technology including information technology networks, as well as hardware and software, is expected to continue to be dynamic in growth and opportunities. Despite outsourcing and globalization, information technology will remain as a key to growth impetus in most industry and occupational areas.

- Three occupational areas: computer hardware engineers, computer and information systems managers, and computer software engineers added jobs during the recent the recession.
- The Federal government will also continue to be seeking individuals to work with surveillance software, and in analyzing foreign intelligence data.
- Demand is great for people with very high security clearances.

Law, Public Safety and Security

Law, public safety and security focuses on judicial, legal, and public safety services for the public and private protection and criminal justice systems has security as a heightened employment need.

- Private-sector outlays for antiterrorism measures and to guard against other forms of violence may now be as much as \$40 billion to \$50 billion a year.
- Security programs are in high demand by students and employers with many colleges adding new certificate and degree programs.
- Some high schools are adding related career and technical education offerings in this career cluster.

Manufacturing

Manufacturing is the processing of materials into intermediate or final products, and related professional and technical support activities such as production planning, logistics and inventory control, quality assurance, and maintenance and manufacturing process engineering. This area continues to have a need for skilled workers.

- Structural changes and productivity limit job growth and increase need for skilled workers.
- Recession and poor perception of workplace limit student interest.
- New and emerging fields include nanotechnology and advanced digital manufacturing.

Marketing and Sales

Marketing and sales includes wholesaling and retailing services and entrepreneurship; professional sales and marketing; buying and merchandising; marketing communications, promotion, information management and research; distribution and logistics; and E-marketing. Direct customer service continues to be a key employment area.

- As production moves offshore, customer sales and consultation becomes more important in U.S.

Science and Technology

Science and technology includes providing scientific research, and professional and technical services (e.g., physical science, social science, and engineering). This includes laboratory, testing, research and development services. Bioscience and nanotechnology are areas of significant potential growth.

- Bioscience receives most attention.
- Concern over numbers of grads and foreign dominance in scientists and its impact on U.S. ability to innovate and compete.

Transportation

Transportation is the movement of people, materials, and goods by road, pipeline, air, rail and water and related professional and technical support services, logistics services, mobile equipment and facility maintenance. This area continues to have a high need for workers in selected occupational categories.

- Just-in-time inventories, foreign imports, and new business models fuel higher demand for transportation.
- Image, long hours away from home, regulations, and cost pressures create shortage of workers.

Other Trends.

- Even though women are going to school and graduating in larger numbers, they still are not being paid as well as their male counterparts after one year of work.
- A disproportionate number of students of color are dropping out of high school in Minnesota.
- States that invest in higher education have dramatic and measurable impacts on both the well-being of the state, and its individual citizens, even when the workforce has at least some type of higher education, including training at community colleges.

Agriculture, Food and Natural Resources

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Careers in Agriculture Gaining Attention

Martin Ross

January 05, 2005

<http://farmweek.ilfb.org/>

At a time when more American jobs in manufacturing and telecommunications are being exported to Asia, interest is growing in careers in agriculture. Yes, agricultural imports are increasing, but Americans are not about to cede very much of their food supply to foreign sources. In addition, U.S. agriculture is much broader today than just food production. It's food, fiber and fuel to name the big three, but it's also agrotourism and countless niche markets and new products connected to farming and the land. The United States has a robust agricultural system that is coming off a year of record net cash farm income and record exports. Agribusiness had a good year, too. Agriculture faces uncertainties, dislocations, and challenges, but one could say that the outlook for careers in agriculture is brighter now than at any time in the last 25 years. No wonder then Associated Press writer John Seewer reported that agriculture studies are on the rise in the nation's high schools. "An increasing number of students in cities and suburbs are taking agriculture classes and considering careers in the industry even at a time when the number of farms is declining," said Seewer. One of the reasons for student interest in pursuing a career in agriculture could be the Agriculture in the Classroom program

Bioscience Careers- the Next Big Thing

Minnesota Economic Trends

Fall 2004

Department of Employment and Economic Development

<http://www.deed.state.mn.us/lmi/publications/trends/>

Bioscience has received plenty of attention lately. And for good reason-the industry has seen a tremendous amount of change recently. Since 1992, the bioscience industry on the national level has more than tripled in size, and revenues have jumped from \$8 billion (1992) to \$27.6 billion (2001). From 1992 to 2001, the number of employees increased from 79,000 to 190,000. Bioscience offers career opportunities in a variety of different industries as well. More than 3 million (national) job openings are projected in three of the bigger bioscience industries through 2010: drug manufacturing, agricultural services, and health services. No state wants to be left out of the bioscience revolution, and Minnesota is no exception. It is estimated that over 60,000 Minnesotans today work for companies with a bioscience research and production component. Two occupations found within bioscience are biomedical engineers and biological technicians.

Career Opportunities Abound in Agricultural Fields

February 10, 2005

Farm Week

<http://farmweek.ilfb.org/>

Agriculture generates some 22 million jobs in the United States, and most are located off of farms. In fact, fewer than 2 million Americans are actively engaged in farming. Today's farmers are efficient enough to produce 16 percent of the world's food supply, freeing the rest of us to pursue other occupations and career paths. Agriculture is science-based, high-tech and offers an array of career possibilities -- from animal and plant researchers, food scientists, commodity brokers, nutritionists, agricultural journalists, bankers, market analysts, sales professionals, food processors, forest managers and wildlife specialists. Marketing,

merchandising and sales science, engineering and specialties related to developing new consumer products from raw agricultural and forest materials.

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Architects Design Their Own Careers

Laura French

March 4, 2005

Star Tribune

<http://www.startribune.com/stories/1757/5274084.html>

Skills in both sculpture and math might make architecture might be a good career choice. Project management involves working with the client, developing and tracking schedules and budgets. Project architecture involves the technical side, creating blueprints and working with contractors. Project design focuses on the creative side.

Principals of large firms do the marketing, making initial contact with clients. As the principal of a small firm, you have to do everything. Another niche in architecture firms is production, specializing in the quick, efficient rollout of retail stores or restaurants. The third niche is the design firm, sometimes called a boutique. These firms tend to stay small and work on pure design. A large firm provides lots of variety. This can include doing everything from helping design Betty Crocker culinary training kitchens to managing construction of a new world headquarters campus. Project architecture involves the technical side, creating blueprints and working with contractors.

Despite good wages, jobs in certain sectors go begging

Ronald A. Wirtz

Federal Gazette

January 2005

<http://minneapolisfed.org/pubs/fedgaz/05-01/blues.cfm>

Shortages are typically in the trades and construction areas with several large commercial building and highway projects under way. Heavy equipment operators are in high demand ... [and are] the most critical shortage, followed by general trades and construction workers. And finally, in Billings, Mont., where “trucking and skilled labor might be showing the most signs of a shortage.

The pattern, of course is that many areas of the district are seeing labor shortages in skilled trades. Skilled trades encompass a broad range of occupations, from construction (carpenter, plumber, electrician, heavy equipment operator, among others) to manufacturing (drafter, machinist, tool and die maker), plant and engine maintenance (mechanic, pipe fitter, welder), power or utility trades (line worker, meter repair), graphic arts (lithographer, press operator) and a variety of services (cosmetologist, painter and auto repair). Within these fields are literally hundreds of additional occupations. Wages vary by location, experience and the particular occupation, but the majority of these jobs pay \$13 an hour or more, often much more. What's ironic about this trend are the loud and persistent complaints from worker advocacy groups about the lack of good-paying jobs. It draws a mental picture of two people yelling past each other for help. And if current trends are any indicator, cities or companies not needing skilled workers might want to take heed. Various demographic and social forces suggest that while good-paying skilled trades careers are available, workers are not putting on the hard hat, picking up the hammer or getting under the hood, so to speak, in numbers proportional to demand. Unfilled job openings make that immediately obvious.

Plumbers Pipe Up About Job's Perks

Susan Kreimer

February 23, 2005

The Dallas Morning News

<http://www.dallasnews.com/>

"The opportunities for men and women in the plumbing industries are endless, from new construction - commercial and residential - to service work and maintenance," said John Hogan, senior superintendent at TD Industries Inc.

"I'm in the commercial end, where the future is as bright as it's been for many years "There just aren't enough good plumbers out there, so when we interview one, rarely do we not make them some kind of offer," he said."Plumbers are one of the top-paid trades people in the construction field because of what it takes to be a good plumber." "Young people aren't being clued in to the satisfaction plumbing jobs can bring." Unless someone piques kids' interest, Mr. Hogan and others who do the hiring can't meet the increase in demand they see down the line.

Business, Management, Finance and Administration

Planning and management includes the following areas: administrative support, information processing, accounting, human resources and other related management support services. Business majors face a very optimistic employment picture.

- A huge demand for accountants and auditors is the result of Sarbanes-Oxley federal legislation.
- A shortage of skilled workers is developing.
- Based on surveys of graduates, students that have an associate, bachelor or master's degree that enter the job market will face an expected 20 percent increase in hiring.

Accounting students in high demand

Tom Locke

October 17, 2004

Denver Business Journal

<http://www.bizjournals.com/Denver>

Sarbanes-Oxley federal legislation has introduced new accounting requirements that have increased demand for accountants, and a recovering economy also has driven demand. Students are aware of that demand, and it's drawing more of them into accounting majors, as is the knowledge that accounting can serve as a good base for business in general. And demand for more accounting work isn't just at publicly traded companies, to which Sarbanes-Oxley applies, but also at private companies, which are coming under pressure from lenders, investors and others to meet Sarbanes-Oxley standards. Student interest has risen in the major, partly due to recent publicity about accounting scandals, the same scandals that led to Sarbanes-Oxley

Auditors can write their own ticket in these post-Enron days

12/29/04

Business Week

<http://www.businessweek.com/>

Big pay raises, new perks, long sabbaticals -- auditors can write their own ticket in these post-Enron days. There has never been a better time to be an auditor. Thanks to congressional demands for more extensive probes, companies and their outside auditors are adding accountants at a record pace. Even the federal government, from the Securities & Exchange Commission to the FBI, is hiring. The crunch stems largely from auditing reforms passed by Congress in the wake of Enron and other scandals. Those changes have increased the number of hours it takes to do a typical audit by 40% to 60%. Yet even as demand has spiked, the supply of auditors is down. In the 1990s, numbers-savvy students bypassed accounting degrees in favor of finance and technology programs.

By 2001 the number of students earning accounting degrees had dropped below 45,000, from more than 60,000 graduates 10 years earlier. Compensation is also on the rise. Most firms say auditors' pay is up 10% to 12% across the board this year. For top people, 20% is probably more like it. Bonuses are more frequent,

too. But bigger salaries are just part of the package. Ernst & Young, which boosted hiring of experienced accountants by 36% this year and added 23% more college grads, doles out more vacation time as well. It even offers free concierge service for staff to get personal errands done. The auditing frenzy won't last forever. Enrollment in accounting classes is climbing, and more students are pursuing a degree. Still, for now, auditing is a great gig.

Coming shortage of skilled workers

Erika D. Smith

December 25, 2004

Akron Business Journal

www.ohio.com/mld/beaconjournal

The Bureau of Labor Statistics projects a shortage of 10 million skilled workers by 2008. In fact, study after study shows that as soon as the economy gets itself together, many people will shop around for new jobs. Many employees are furious and fed up at the way their companies have treated them during the recent downturn. Mass layoffs and health care cuts in the name of profits haven't exactly engendered trust. Job retention is a growing priority for U.S. companies.

Laws stir demand for IT auditors

Victor Godinez,

7/20/04

Dallas Morning News

<http://www.dallasnews.com/>

When companies need better data systems, they hire people to set them up. IT auditors are some of the hottest tech workers in the job market right now. The Health Insurance Portability and Accountability Act and the financial sector's Gramm-Leach-Bliley Act have also boosted the need for IT professionals skilled at helping companies navigate the legislative waters, he said. "Usually, you have to have a technical background to understand the tools that are used," he said. "There are software packages available to do a lot of the Sarbanes-Oxley tabulation and collection of data, and similarly for the medial privacy aspects and for the G-L-B compliance aspects."

Accounting for growth in the field

Tom Locke

Business Journal

10/17/4

www.ohio.com/mld/beaconjournal

"Sarbanes-Oxley is the accounting full-employment act," said Ron Kucic, director of the school of accounting at Daniels College of Business. And demand for more accounting work isn't just at publicly traded companies, to which Sarbanes-Oxley applies, but also at private companies, which are coming under pressure from lenders, investors and others to meet Sarbanes-Oxley standards.

Professional services cleaning up

Business Week

1/10/5

<http://www.businessweek.com/>

Increased government spending on consulting and new federal regulations on auditing proved a bountiful combination for professional services. Auditors' biggest challenge is to increase staff fast enough to meet demand. For lawyers and accountants, the Sarbanes-Oxley Act continues to be a boon. Its requirements for sharper audits, better informed board members and tighter internal financial controls all play to professionals' strengths. Inside Public Accounting predicts global growth for all Big Four accounting firms will be 9% to 12% for fiscal 2005. The cost of a typical audit has already jumped by up to 60% since the law's passage in 2002. Provisions that apply only to the 4,000 largest companies will expand to encompass 10,000 more next year.

Education and Training

This category providing education, training and other related learning support services such as assessment, and library and information services.

- To fill the numerous teaching vacancies, as many as 2.2 million teachers are needed between 2000 and 2010.
- Recent Census Bureau data show that 45 percent of librarians will reach retirement age by 2010.
- The education area, including the corporate for-profit model, is the fastest-growing segment of the \$315.5 billion postsecondary market in North America.

Jobs looking up for librarians

By CINDY MAYS

Dallas Morning News

March 2005

<http://www.dallasnews.com/>

In the old days, a search for information began at the library, flipping through the card catalog and wandering among stacks of books under the watchful eye of the ever-present librarian. Although technology has dramatically changed how a search is performed, knowledgeable librarians, sometimes referred to as "human search engines," remain a valuable resource. Today's librarians are trained information specialists, dealing not only in books but also advanced technology and information literacy, which includes the Internet, remote access, CD-ROMs and virtual libraries. Even the most traditional library positions require a thorough knowledge of technology.

Recent Census Bureau data show that 45 percent of librarians will reach retirement age by 2010. This "graying" of the profession has spurred efforts by industry advocates and universities to ensure that a new group of trained librarians is ready to replace them. Library school placement centers report that most of their graduates find work within six months. "Our placement is somewhere around 87 percent," said Dr. Sam Hastings, interim dean of the School of Library and Information Science at the University of North Texas. "Most of our students get hired by libraries, archives or traditional information centers."

How do the new teachers measure up?

March 8, 2005

By Teresa Mendez

The Christian Science Monitor

<http://www.csmonitor.com/>

No longer your stereotypical schoolmarm, a schoolteacher today has a profile markedly different from a generation ago. She - teachers are still overwhelmingly female - is less likely to make teaching a lifelong career. Having possibly worked in another field first, she's a bit older than her counterpart 40 years ago. Chances are, she's also more educated. But there's one shift in the new demographic of teachers that has drawn particular attention - and concern. It seems that fewer "high-aptitude" women - those from the most selective colleges with stellar SAT scores - are becoming elementary and high school teachers.

"These teachers were never a big share, but they were a non-negligible share," says Caroline Hoxby, a professor of economics at Harvard University in Cambridge, Mass., whose research focuses on the economics of education. "People say they were important leaders. They weren't in every classroom but they were mentors." Ms. Hoxby and Andrew Leigh of the Australian National University have authored the latest study on aptitude in the newest generation of schoolteachers. In a sense, their findings simply underscore a broader issue - the widespread need for talented teachers to step up to the chalkboard as baby boomers begin retiring. To fill the vacancies, as many as 2.2 million teachers are needed between 2000 and 2010. Certainly most experts would agree that creative new strategies must be employed to ensure the brightest are included in this bunch.

The Business of Education

Randy Southerland

January 17, 2005

Bizjournals

<http://www.bizjournals.com/industries/>

The growth of the corporate for-profit schools is hard to ignore. With reported revenue of \$853 million for the fiscal year ending in June, compared with \$640 million in 2003, EDMC is one of several corporations that has made the for-profit market one of the fastest-growing areas of the \$315.5 billion postsecondary market in North America, according to U.S. Department of Education figures. Career Education Corp. also saw similar growth, reporting total revenue for the nine months ended Sept. 30 of \$1.3 billion. This was a 53 percent jump from \$817.3 million for the previous period. Student population on its 82 campuses in North America, Europe and the Middle East rose more than 22 percent to 97,300 in 2004. DeVry reported total revenue of \$784.8 million for the period ending in June, compared with \$679.5 million for 2003.

With large state universities capping enrollment, qualified students are seeking educational opportunities elsewhere, he said. "The other thing is we've seen, at least in some systems, smaller increases in funding for public education and increases in demand," Humphreys said. The increased demand is driven by increased population growth and a rise in real income, he added. "Education is pretty income-elastic," he said. "As incomes rise, the proportion of educational services purchased is rising faster. You've got more than a one-to-one bang for the buck." Slow job growth also has increased the appeal of additional training.

Government and Public Administration

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Gender Pay Gap Smaller in Public Sector

Julie Forster

June 13, 2004

Twincities.com

<http://www.twincities.com>

The US Census reported pay disparities in public sector jobs came closer to closing the gender pay gap. In some public sector jobs, women are fairly close in pay. Women highway maintenance workers made 94 cents to the dollar, mail carriers made 91 cents, and police and sheriff patrol workers made 90 cents. Parking enforcement workers made 98 cents.

Data from the Minnesota Department of Employee Relations shows that the gender gap for state workers is 97 cents for women compared to 73 cents to the dollar in the early 1980s. Preliminary findings show that female local government workers make 85 cents to the dollar compared to men.

Terrorbusters Inc.

Louis Uchitelle and John Markoff

October 17, 2004

NY Times

<http://www.nytimes.com/>

Government spending on domestic security is huge and growing fast. Federal outlays reached \$41 billion during the just-ended fiscal year, up from \$33 billion in fiscal 2003 and \$21 billion in the year that ended days after 9/11, according to the Congressional Budget Office. (Those figures do not include spending by the Department of Homeland Security on activities unrelated to fighting terrorism.)

There may be a lot more on the way. If Congress goes along with President Bush's budget proposals, the federal contribution will rise nearly 15 percent, to \$47 billion. In the current fiscal year, state and local governments have added from more than \$7 billion their own pockets since 9/11 for more police and fire department protection. "The need for homeland security, given the terrorist threat, is like a transaction cost," said Douglas Holtz-Eakin, the director of the Congressional Budget Office.

As the overall cost approaches \$100 billion, domestic security is beginning to take on the characteristics of military spending in the early years of the cold war. Just as an open-ended fear of Communism drove that spending surge, the open-ended terrorist threat is driving today's spending on domestic security.

Growth of Federal Job Opportunities

February 15, 2005

<http://www.ourpublicservice.org/pressroom>

The government expects to fill over 37,000 security and enforcement-related positions, from criminal investigators to police officers to airport screeners. Next on the government's "most wanted" list are jobs in: Public Health (physicians, nurses, pharmacists, medical technicians) 25,756 new hires expected in the next two years.

Health Sciences

Health Sciences focuses on providing diagnostic, therapeutic, informational and environmental and support services in health care, including biotechnology research and development. Most employers were attempting to cope with the nursing and staffing shortages and application of new technology.

- In Minnesota it appears that the shortage may be declining because people returned to nursing.
- Medical technology is being used to make the work of medical professionals more efficient and to better serve the clients. It is being applied to every facet of medicine from paperless record keeping to high tech devices for home health care.

Pulse Strong for Nursing Programs

Mary Jane Smetanka

July 18, 2004

Star Tribune

<http://www.startribune.com/>

After years when many Minnesota nursing programs could barely fill their entering classes, more people want to be nurses than colleges and universities can accept. The schools have expanded in recent years, but they don't have the money, the classrooms or the faculty members to admit more students. And they now have trouble finding enough good places for student nurses to get clinical experience.

Projections by federal agencies estimate that the United States will need anywhere from 600,000 to 1 million additional registered nurses by 2010. In Minnesota, the Minnesota Hospital Association reports a shortage of 2,000 registered nurses now and predicts that will swell to 8,000 by 2020.

Nursing Grads Wait for Work

Julie Forster

August 22, 2004

Pioneer Press

<http://www.twincities.com/>

Despite reports of a critical shortage in nursing, job openings are down significantly in Minnesota. In Minnesota, vacancy rates for nursing positions in metro hospitals have dropped to an average of 2 percent from the double digits just a few years ago. Just since last year, hiring of new graduates at clinics and hospitals is stagnant or has stopped.

State data show that job openings for registered nurses have fallen as the pool of candidates increases. In the second quarter, there were 1,900 vacancies - a rate of 3.7 percent, or 3.7 vacancies per 100 jobs. That

compares with 2,000 vacancies for the same period last year, 2,900 in 2002 and 3,000 openings, or a 6.8 percent vacancy rate, in 2001.

A Chip for Your Body

Vito Pilioci

June 27, 2004

Ottawa Citizen

<http://www.publichill.com/news/040722virichip.php>

For years, the technology has been implanted in cats, dogs and millions of other animals for identification purposes. It uses "radio frequency identification" technology, the same technology Wal-Mart has ordered suppliers to start including in products, in order to make the chore of taking inventory much easier. A medical professional uses a needle to inject the Verichip under the skin. A special bonding agent, which surrounds the chip, then activates to hold it in place and prevent the device from floating around the body.

The technology is about to give emergency room doctors instant access to a patient's health-care records. With the Verichip, a doctor could have access to a person's medical records, allergy information, previous surgeries and other information.

Mayo Ends Paper Medical Records

Scott D. Smith

July 16, 2004

Minneapolis-St. Paul Business Journal

<http://www.bizjournals.com/>

The Mayo Clinic in Rochester announced that the paper trail ended for outpatients. From now on, the medical records resulting from nearly 1.5 million outpatient visits per year will be created and stored electronically. The clinic started converting to electronic medical records 11 years ago. Converting to electronic medical records has become a goal for many Minnesota hospitals and clinics. For example, Minneapolis-based Allina Hospitals & Clinics is engaged in a \$100 million project to institute electronic records.

Electronic records are more convenient for patients and physicians and can reduce medical errors, such as failing to notice drug allergies or other preexisting conditions. It also gives physicians immediate access to a patient's records, including physician notes, orders for tests and medications -- as well as laboratory and test results.

Most Physicians' Assistants Use The Net in Their Practices

Victor Godinez

September 2004

Dallas Morning News

If you're thinking of becoming a physician assistant, make sure your computer skills are up to snuff.

According to a recent survey from the American Academy of Physician Assistants, 87 percent of PAs say they use the Internet in their practice, up from 76 percent in 2001.

"Technology continues to play a greater role in the delivery of health care, and like many health care providers, PAs are embracing new technologies to improve patient care," said Stephen Crane, executive vice president and CEO of the American Academy of Physician Assistants. Nearly all respondents reported having access to the Internet and e-mail at either home or work. Ninety-three have access to e-mail and 94 percent reported having Internet.

New Technologies May Ease The Pain

Susan Kreimer

January 10, 2005

Dallas Morning News

<http://www.dallasnews.com/>

At Zale Lipshy University Hospital, a new Web-based system known as Kronos is expected to lighten the load. "They can fill staffing needs, and they can put in requests for vacation. They can self-schedule themselves," said Stephanie Huckaby, a nurse manager. "Whatever they do, the system will notify me as a manager electronically."

The goal is to make "all systems as paperless as possible," said Terri Murray, a nurse manager at Cleveland Clinic Foundation, which has started providing each nurse with a separate e-mail address. Nursing and technology divisions teamed up to form "a nursing unit of the future." This unit tests new information technologies and communication tools to improve patient care and nursing practices. "We're trialing different grab-and-go computer tablets," Ms. Murray said. "The tablet is going to be the vehicle for the electronic medical record." Nurses carry the handheld devices – each weighing 1.5 to 3 pounds – into patient rooms for admission assessments.

The Dawning Age of "Silver Tech"

Olga Kharif

July 7, 2004

Business Week

<http://www.businessweek.com/>

Innovative startups are already piling into the market. New-York-based Living Independently, LI, offers infrared motion detectors. Its systems report abnormalities -- such as no movement at the house for a prolonged period of time -- to a caregiver's pager, cell phone, or e-mail account. Home-monitoring technology will grow in sophistication and capabilities. LI's sensors also measure and report temperature within the house. By late 2004 or early 2005, the company plans to begin providing caregivers with readouts from the resident's glucose monitor, blood-pressure monitor, and scale, Boyajian says.

Companies like Intel and health-care instrumentation maker Siemens Medical, a division of Germany's Siemens (SI), envision a smart home that will eventually collect and analyze data on its owner's well-being unobtrusively and automatically, while the user goes about his daily life. This smart home would sound an alert if its resident falls down and can't get up. During a favorite TV show, it would pop up a reminder for the patient to take a pill. Using voice commands, the system would walk an Alzheimer's patient through the process of preparing a meal.

Hospitality and Tourism

Hospitality and tourism including the marketing and operations of restaurants, lodging, recreation, attractions and tourism is a growth industry.

- Leisure and hospitality is the second fastest growing industry in Minnesota.
- The restaurant industry is the nation's largest employer outside government employment.
- Hotel management is a growth occupation.

The Future of Tourism in Minnesota

Rachel Hillman

Minnesota Department of Employment and Economic Development

Fall 2004

<http://www.deed.state.mn.us/lmi/>

While the Travel Industry Association of America expects business and leisure travel to improve in 2004, 10-year employment projections through 2010 for Minnesota's hospitality and leisure industry show even more promise. Employment in the leisure and hospitality industry is expected to increase by 144,000 jobs—or 19.2 percent between 2000 and 2010—making it the second-fastest-growing industry in Minnesota.

This employment expansion will largely be driven by the amusement and recreation services and eating and drinking industry, sub-sectors of the larger leisure and hospitality industry. The projected growth of the leisure and hospitality industry may have something to do with the aging population. The number of persons over the age of 65 is expected to double in the U.S. by 2025. The trend is the same in Minnesota as one stunning statistic illustrates: in 2000, fewer than 600,000 Minnesotans celebrated their 65th birthday compared to an estimated 1.1 million who will do so in 2025. With 12.1 percent of the population already in retirement, it's likely that the demand for leisure activities will increase. Money for travel won't be a problem if these trends continue: in 2000, elderly Minnesotans lived longer than in 1990; they also had higher incomes and lower poverty rates.

Fast-track Careers: Part Two

Kim Clark

March 21, 2005

US News

<http://www.usnews.com/usnews/biztech/>

The job market hasn't been this rosy since the pre-recession hiring boom of the late '90s. But things are changing, with employers adding a large number of jobs this year. No matter how buoyant the job market is, though, there are still some professions and industries that offer more or better or higher-paying opportunities.

Casino "cage" worker. Americans are gambling more than ever, and casino construction is booming both in Las Vegas and at American Indian casinos. A handful of casinos under construction in Mississippi have posted hundreds of help-wanted ads on *Casinocareers.com*. But Michael Borden, marketing manager of the website, says there are plenty of applicants for glamorous jobs like poker dealer and big-tip jobs like waitress. Better odds can be had in the "cage," where cashiers turn gamblers' bills into chips and supervisors keep watch on the cash. Cashiers need little more than a high school degree, a clean record (to pass a background check), and an ability to make change accurately and quickly. Anyone with college training in accounting and finance can try to work up to a supervisor's job. Cage managers usually need a college degree in business, finance, or accounting and at least five years' cage experience. Cashiers start out at \$7 to \$9 an hour. But managers can pull down \$75,000 a year.

National Restaurant Association Information on the Industry

Linda Busche

March 9, 2005

Restaurant magazine

<http://www.restaurant.org/>

The restaurant industry employs 12.2 million people, making it the nation's largest employer outside the government. Nine out of 10 salaried employees at table service restaurants — including owners, operators and managers — started as hourly employees. More than two out of five adults (42 percent) of American adults have worked in the restaurant industry at some point in their lives. Opportunities in the restaurant industry are varied. The restaurant industry offers opportunities in catering, banquet management, public relations, accounting and senior executive positions. There is a place for everyone in the restaurant industry. From a handful of schools in 1970, there are now more than 1000 college level programs that specialize in restaurant or hospitality management, plus hundreds of culinary schools and programs. In addition to this postsecondary training, there is also specialized training at the secondary school level, as well as rewarding professional development programs.

Hiring CEOs From Outside the Hotel Industry

Christopher Mumford

March 29, 2005

HVS International

<http://www.hospitalitynet.org/>

The fact that three of the world's largest hospitality players chose to recruit Chief Executives from outside the hotel sector is not so much uncanny as a reflection of the changing strategic direction of today's hotel

companies. One point of particular interest is that, at a time when the hotel industry in general is experiencing such difficulty in attracting and retaining new talent, three of the world's biggest players chose to ignore the traditional profile of hotel and real estate backgrounds and decided to plump for candidates with completely different experiences and skill sets.

This example however is typically the exception rather than the rule. Rarely do hotel companies consider taking what they perceive as a gamble to hire individuals with no prior hotel experience. Naturally, we should continue to support hotel schools, promote hotel management as an attractive career, and hire individuals with hotel backgrounds. At the same time however, the hotel industry is facing an ever dwindling population of future talent.

The Lodging Lab: Student-run Hotels and Facilities Add a Dimension to Colleges and Universities

By Christine Pruitt-Jennings

March 2005

Lodging Magazine

<http://www.lodgingmagazine.com/>

In the past few years, colleges across the country have experimented with the development and refinement of facilities in the hopes of helping their students make it to the top of hotel companies' recruiting lists. One of these experiments is the ultimate form of hands-on learning—student-run hotels and facilities.

Many universities have recently made, or are in the process of making, strides in this area: Cornell University recently dedicated its Beck Center, the University of Denver is awaiting completion of its new student-run conference center, the University of Delaware recently opened a hotel on campus, the University of Nevada at Las Vegas is in the planning stages of a student-conceived/developed hotel, and last February Johnson & Wales bought and renovated a hotel which will be the center of its new Charlotte, N.C.-based campus. That's an ideal that many hospitality programs attempt to embody. Many colleges and universities that have on-campus facilities are encouraging faculty members to use the facilities in class as education tools.

Human Services

Within the rapidly growing human services area including family, social and related community services, many occupational growth areas are excellent. With the aging of the baby boom generation, health and human services are in demand.

- In the Government employment area, the Federal government is hiring many persons across its wide employment spectrum to replace retiring workers.
- Several of the new and emerging occupations such as bill review nurse, adult protective services, and cheer workers, will be in Human Services.

Where the Hot Jobs Will Be

Les Christie

February 4, 2005

CNN/Money

<http://money.cnn.com/2005/>

One key factor in creating job opportunities is the aging of America. As baby boomers, 77 million strong, approach retirement age, they've started to consume a host of services and products that are different from what they used at a younger age. Even though boomers may remain active far longer than the generations that preceded them, they'll still have to cope with a variety of health and wellness issues. Many of the fastest growing employment opportunities are in health care. Nurses, physical therapists, and physician's assistants jobs are all increasing steadily, sometimes spectacularly.

"You also have a great number of people at the federal government who will reach retirement age over the next several years," says Kevin Simpson, executive vice president of the Partnership for Public Service, a non-profit, non-partisan organization dedicated to revitalizing federal government service. With 1.8 million workers, the federal government is the country's biggest employer, and it will have to have to go on a big hiring binge, adding nearly 150,000 jobs over the next two years alone.

New State Job Forecast: Fewer Jobs, and More in Service

Julie Forster

December 16, 2004

St. Paul Pioneer Press

<http://www.twincities.com/>

Minnesota's job growth over the next decade is expected to be far less than during the roaring 1990s and likely will continue a gradual trend toward more service jobs and fewer production jobs. The state Department of Employment and Economic Development released its most recent 10-year employment projections in December 2004. Its conclusion: The economy will add 425,000 jobs, — growth of 14.7 percent — between 2002 and 2012, slowing from a rate of 20.8 percent in the preceding 10 year period.

It is predicted that growth will be the greatest in the service-providing industries, especially professional business services and education and health services. Almost half of all new jobs are expected to be in these areas. The biggest industry losers will be computer and electronic product manufacturing, crop production and paper manufacturing.

New and emerging occupations

Jerome Pikulinski

Monthly Labor Review

December 2004

<http://www.bls.gov/>

According to the OES survey, in 2001, most new and emerging (N&E) occupations were in firms with fewer than 100 employees. No single industry dominated in the creation and growth of these occupations. More than one-half of these were distributed among human services, transportation, communications, business and personal services, and a wide variety of wholesale and retail trade activities. Slightly more than half of all N&E occupations were paid in a range of \$8.50 to \$17. No single State or single occupational classification dominated in the creation of N&E occupations; however, healthcare, management, and production occupations were the three most frequent occupation classifications observed. Information on specific occupations that are new or emerging is listed as follows:

Social service: Bill review nurse, Adult protective services, Energy auditor, HazMat drivers, Weatherization director, Director information management, Cheer workers, and Disaster preparedness staff. There are several groups of occupations in social services — nurses and information management workers employed in new fields; workers helping seniors and others in their homes; and disaster preparedness staff. Nurses continue to be employed in areas other than those directly related to providing clinical care services, primarily in the control of medical costs. In addition, a new occupation for nurses was found in the legal field where they are employed as legal nurse staff specialists. Information management, like nursing, is not a new field, but one that continues to appear in a number of new industry settings. Senior and disabled persons are creating situations calling for cheer workers who provide opportunities for therapeutic interaction and others who investigate charges and complaints of mistreatment. Drivers qualified to deliver hazardous materials may provide oxygen to residences and other service locations. Providing services for the insulation and heating of residences has created occupations in weatherization and heating cost recovery. Finally, increased awareness of disaster preparedness is driving the creation of related positions.

Federal Government

Olivia Crosby

Occupational Outlook Quarterly

Summer 2004.

<http://stats.bls.gov/opub/ooq/2004/summer/art01.htm>

Designing the International Space Station, uncovering security threats, conserving the Florida Everglades, creating an ad campaign to combat disease—these are examples of just a few of the tasks done by workers in the Federal Government. With more than 1.7 million jobs and over 400 occupational specialties (excluding postal service and military workers), the Federal Government offers more choices than any other single employer in the United States. Whatever your interest and background, you can probably find a

Government career to match. Searching for a Federal job can be more complicated than other job searches. That's because of regulations designed to keep the hiring process fair. Job titles are standardized. Resumes are more detailed. And job qualifications are more specific. Tailoring your search to the Federal Government's rules will increase your chances of getting a job

Information Technology

Information Technology including information technology networks, as well as hardware and software is expected to continue to be dynamic in growth and opportunities. Despite outsourcing and globalization, information technology will remain as a key to growth impetus in most industry and occupational areas.

- Three occupational areas: computer hardware engineers, computer and information systems managers, and computer software engineers added jobs during the recent the recession.
- The Federal government will also continue to be seeking individuals to work with surveillance software, and in analyzing foreign intelligence data.
- Demand is great for people with very high security clearances

A Few Tech Fields Added Positions during Downturn

By Victor Godinez

March 16, 2005

The Dallas Morning News

<http://www.dallasnews.com/>

<http://www.ieee.org/portal/site>

Not all tech jobs collapsed with the economy. Some thrived through the recession, new research shows. IEEE-USA, a branch of the Institute of Electrical and Electronics Engineers, recently sifted through federal data to look at employment changes for six major technical fields from 2000 to 2004. Overall, it found that IT employment fell by more than 220,000 positions over the four-year period. But the declines weren't across the board. Three fields – computer hardware engineers, computer and information systems managers, and computer software engineers – added jobs. Computer programmers, computer scientists and systems analysts, and electrical and electronics engineers lost jobs. "Some industries and fields are bringing in people, and others are still downsizing," said Paul Kostek, head of IEEE-USA's Career and Workforce Policy Committee. IEEE-USA isn't the only group highlighting the growth specialties.

In its January issue, Fast Company magazine ranked and published a list of the 25 top jobs for 2005 based on job growth, salary potential, education level and the amount of creativity and innovation available to workers in that field. Among the 25 were computer software engineers. "The software industry grew 6 percent in 2004 alone," the magazine said. "Normally, a bachelor's degree in computer engineering or science is sufficient to get a good position, meaning the job ranks high on the education index but not quite at the top." It added, "The profession is well-paying but only a gold mine for those with unique, specialized skills."

Government Spawns a Tech Boom

March 21, 2005

US News

<http://www.usnews.com/>

While much of the tech world has not yet fully recovered from the dot-com meltdown, Virginia--home to both the Pentagon and the world's largest naval base at Norfolk--is feasting on the financial buffet the federal government has laid out since 9/11. The feds are looking for help in developing surveillance software, assistance in integrating the agencies brought together to make the Department of Homeland Security, and aid in analyzing reams of foreign intelligence data. One sweet irony: So many new jobs require security clearances that the government had to create even more jobs by hiring outside companies to help vet candidates.

The best candidates have a top-secret government security clearance. But those who haven't been through the vetting process shouldn't give up hope. They can add another big plus: the skill to work well with a team and with clients.

Some employers describe the current situation in historic terms--and not the Web-driven hiring mania of the late '90s. "It's like running out of iron ore in the middle of the industrial revolution," says Renny DiPentima, chief executive of federal contractor SRA International. "We are in an information-technology revolution, and in certain areas we are running out of knowledge workers." His company, which added 1,000 workers last year and is, looking to hire 1,200 more, sees an excellent candidate pool in those leaving the military. They already have clearances and "a great work ethic and real knowledge of the challenges government faces."

The Digital Hospital

Timothy J. Mullaney and Arlene Weintraub

March 28, 2005

<http://www.businessweek.com/magazine/>

Hackensack University Medical Center in Hackensack, N.J is one of the nation's most aggressive tech adopters. Millions of dollars in investments have paid for projects well beyond an online drug system. Doctors can tap an internal Web site to examine X-rays from a PC anywhere. Patients can use 37-inch plasma TVs in their rooms to surf the Net for information about their medical conditions. There's even a life-size robot that doctors can control from their laptops at home. They direct the digital doc, complete with white lab coat and stethoscope, into hospital rooms and use two-way video to discuss patients' conditions.

Is this the health-care industry's future? It would be a startling reversal. For years health care has missed out on the huge benefits that information technology has bestowed upon the rest of the economy. Hospitals were not only cheapskates when it came to investing in computers and Web technologies but also had a knack for wasting the money they did spend. During the 1990s, productivity in health-care services declined, according to estimates from Economy.com Inc. That's a huge underachievement in a decade of strong gains for the overall economy.

What to Tell the Kids

Barbara Gomolski

October 18, 2004

Computerworld

<http://www.computerworld.com/careertopics/careers/>

There are fewer IT positions available today than there were just five years ago if we consider traditional IT roles, such as infrastructure management, support and programming. What's more, the jobs that are available in IT increasingly require skills that aren't taught as part of the computer science curriculum. But the changes in the IT job market affect all IT professionals, not just those new to the field. The days of studying computer science, getting an entry-level job as a programmer and moving up the IT ladder are gone. First of all, there are fewer programming jobs available now, because of offshore outsourcing. Second, we can no longer assume that a general computer science degree is going to prepare graduates for the IT job market. Certainly, some firms are still hiring new talent through the programming ranks, but this process is not nearly as common as it used to be. As a result of automation and the spread of consumer IT, we don't need as many people as we once did to manage IT systems. Technology is more standardized, and end users are more familiar with technology. The increasing pace of business, industry consolidation and globalization means that most of us will move from company to company during our careers. All professionals -- not just those in IT -- will gather the skills they need from multiple employers. The following are demand areas for IT.

Business process design and management. Business process design -- something IT has always been expert at -- is starting to surface as a new competency for IT professionals. Their prowess at process design comes from getting to see entire business processes as they build IT systems

Information management. Companies are generating more and more data about their customers, partners and competitors. Organizations are going to need individuals who can help turn this data into usable information. This includes experts in customer relationship management, business intelligence and search technologies.

Got clearance? You're in demand.

December 4, 2004

Dallas Morning News

<http://www.dallasnews.com/>

"If you're a technology professional or an engineer and you have an active security clearance, it's a terrific job market for you right now," said Scot Melland, president and chief executive at technology recruiting firm Dice.com. Mr. Melland said that tech projects launched after the Sept. 11, 2001, terrorist attacks are starving for qualified workers. "You've got billions of dollars of new technology projects that have been approved and funded in the last couple of years," he said. "Most of that federal IT spending goes into the defense and homeland security areas, and a lot of those projects require security clearance."

"Demand is on fire for people with very high security clearances," said Burt Heacock, a partner with staffing firm Paul-Tittle Search Group in McLean, Va. What technical skills are federal contractors looking for? "All the hottest programming and networking skills, .Net programming, and Java programming, Web-based software development – those kinds of things are what they're mostly after," he said

Law, Public Safety and Security

Law, public safety and security focuses on judicial, legal, and public safety services for the public and private protection and criminal justice systems.

- Security programs are in high demand by students and employers with many colleges adding new certificate and degree programs
- Some high schools adding related career and technical education offerings in this career cluster.
- Private-sector outlays for antiterrorism measures and to guard against other forms of violence may now be as much as \$40 billion to \$50 billion a year.

The Rise of the Homeland Security-Industrial Complex

By Louis Uchitelle

October 17, 2004

New York Times

<http://www.nytimes.com/>

Corporate America is spending heavily for protection. Private-sector outlays for antiterrorism measures and to guard against other forms of violence may now be as much as \$40 billion to \$50 billion a year, or two or three times higher than the annual rate before 9/11, according to estimates compiled by CQ Homeland Security, a daily Internet newsletter published by Congressional Quarterly. The federal government's contribution has also passed the \$40 billion mark, double what it was before 9/11. As the spending soars, domestic security seems poised to become a significant factor in the overall economy, much the way military spending was during the cold war.

THE question is: What is enough security?" said Gordon Adams, who oversaw national security spending at the Office of Management and Budget in the Clinton administration and now heads a security policy studies program at George Washington University. "The answer is, no one knows, and fear is a powerful driver here. Since we do not know who means us harm, where they are and how long they are going to continue to mean us harm, where do you stop?"

Computer Forensics Seen as Demand Areas.

By Victor Godinez

February 20, 2005

The Dallas Morning News

<http://www.dallasnews.com/>

Technology jobs for college graduates haven't disappeared. You just need to know where to look. Whether it's creating prototype parts for NASCAR racing teams, building the components of high-definition televisions or hunting cyber criminals, there are plenty of exciting technical careers opening up over the next several years to Texas grads, experts say. A recent study sponsored by the Texas State Technical College System found three industries in which jobs are likely to increase for technical and community college grads. <http://www.tstc.edu/> TSTC has released similar studies the last few years to identify courses that colleges might want to introduce as demand for workers in those fields increases. The three industries in the most recent report were advanced digital manufacturing, micro-electromechanical systems and computer forensics.

Think of it as CSI: Online. "The demand for technicians skilled in computer forensic techniques is ever-growing," the report said. "The 2004 FBI Computer Crime and Security Survey indicate that computer crimes against businesses are widespread, accounting for millions of dollars in identifiable losses. "The main reason for the low enforcement and prosecution rates is the shortage of law enforcement personnel qualified to deal with computer crime." In high demand are technicians skilled at unraveling the trail of hackers and identity thieves who use computers. "Opportunities exist for computer forensic specialists in both the public and private sectors," the report said. "The majority of currently available jobs are with law enforcement agencies, but many corporations are recruiting these services for their in-house IT teams to combat employee misbehavior and the misappropriation of intellectual property."

New and Emerging Occupations: Computer Privacy/Security Analyst

Source: Michigan Careers, Colleges and Training service

March 2005

<http://www.michigan.gov/>

The Michigan Career Portal provides a site that serves as a bridge to state and national employment, career, education, training, and business resources and services. As an ongoing research effort, data on new and emerging occupations are reported as a resource for career planners. An emerging occupation cited on the resource page included Computer Privacy/Security Analyst. The analyst evaluates current methods and procedures regarding web site security and customer privacy. Plans, coordinates, and implements changes in network security measures in order to protect data, software, and hardware. Monitors performance and use of computer security and emergency data files and regulates access to safeguard information in computer files. Be responsible for firewall administration. Investigates new firewall strategies and software. The average salary is \$63,200 a year with an annual range from \$44,300 to \$88,500 a year. A bachelor's degree is considered the minimum education for this occupation.

Many Community College Programs See High Demand

Sara Mcphee

October 26, 2004

Community College Times

www.aacc.nche.edu/hotprograms

Graduates in allied health, information technology, skilled trades, business and public services continue to enjoy marketplace demand for their skills. In a new survey of community colleges by the American Association of Community Colleges (AACC), the second most sought-after program was in law enforcement, but it accounted for less than 6 percent of programs most in demand. The study found that 65 percent of all courses and programs added between 1997 and 2000 were in computer technologies.

The latest survey of hot programs, conducted earlier this year, finds that nearly two-thirds of college leaders have reviewed or modified curriculum to address homeland security needs. Of those, 20 percent have added new programs to meet local needs and half have added new courses. Other cutting-edge programs being added, along with the percentage of respondents who said their colleges were including

them are: homeland security (11.9 percent), internet technologies and computer networking (4.9 percent each), and law enforcement (4.6 percent).

Vocational Education Embraced by College-bound

Peter Smolowitz

November 1, 2004

Charlotte News

<http://www.charlotte.com/>

As school districts educate for a new economy, the stereotypical shop class is being replaced by courses in digital communication, bioengineering and nanotechnology. The word "vocational" has become taboo -- it's now called career and technical education -- and with the new name has come a more advanced curriculum. Besides the name -- career and technical education (CTE) -- vocational classes have evolved. "You have to be training for the next tier of jobs," said Bob Couch, director of career and technical education for the S.C. Department of Education. Here is an example:

Law, Public Safety and Homeland Security Academy: students from four CMS high schools take classes at Central Piedmont Community College that will include dusting for fingerprints, looking for bloodstains that have been cleaned and discovering digital evidence.

Manufacturing

Manufacturing is the processing of materials into intermediate or final products, and related professional and technical support activities such as production planning, logistics and inventory control, quality assurance, and maintenance and manufacturing process engineering. This area continues to have a need for skilled workers.

- Structural changes and productivity limit job growth and increase need for skilled workers.
- Recession and poor perception of workplace limit student interest.
- New and emerging fields include nanotechnology and advanced digital manufacturing.

Lack of Skilled Employees Could Become Serious, Manufacturers Fear

By Rick Barrett

March 7, 2005

<http://www.jsonline.com/bym/news/mar05/307642.asp>

Not everyone is hanging out the "help wanted" sign, as increased automation and lean manufacturing strategies have eliminated many jobs. In 2002, for example, Wisconsin Aluminum Foundry Co. in Manitowoc had \$52 million in sales and 600 employees. Last year, it had \$50 million in sales, but only about 350 employees. "We had to work with our union to change job classifications, but we are definitely working smarter," company sales manager David Hilburger said. The projection of a shortage of more than 10 million skilled workers by 2020 could be high, given that the Bureau of Labor Statistics said there are only 14.4 million manufacturing jobs in the U.S. today. But there is a shortage, and it's getting worse as older workers retire and fewer young people are willing to take their place on the factory floor.

Today's High-Tech How Big a Player is Minnesota?

by Cameron Macht & Scott Moore

Minnesota Economic Trends

Fall 2004

Department of Employment and Economic Development

<http://www.deed.state.mn.us/lmi/publications/trends/>

While some jobs have disappeared due to unsustainable business models, collapsing demand, or the movement of work overseas, a larger number of manufacturing jobs have been eliminated because high-tech employers are building new technologies and management techniques to achieve productivity gains.

Many economists agree that most of the decline in high-tech employment is the paradoxical result of each employer's ability and need to become continually more productive, a circumstance made worse by the pressures of a weak economy. Although they create new products and processes, innovative high-tech manufacturers often also eliminate jobs in a constant struggle to do it "better, faster, and cheaper."

BLS analysis in a March 2002 study shows that the high-tech manufacturing sector has dominated other manufacturing specialties with respect to productivity growth. Labor productivity - defined as output per unit of labor input - increased 9.5 percent per year in high-tech manufacturing industries between 1987 and 1999. Over the same period, labor productivity in manufacturing as a whole gained only 3.2 percent per year.

Despite Good Wages, Jobs in Certain Sectors Go Begging

Ronald A. Wirtz

Federal Gazette

January 2005

<http://minneapolisfed.org/>

The pattern, of course is that many areas of the district are seeing labor shortages in skilled trades. Skilled trades encompass a broad range of occupations, from construction (carpenter, plumber, electrician, heavy equipment operator, among others) to manufacturing (drafter, machinist, tool and die maker), plant and engine maintenance (mechanic, pipe fitter, welder), power or utility trades (line worker, meter repair), graphic arts (lithographer, press operator) and a variety of services (cosmetologist, painter and auto repair). Within these fields are literally hundreds of additional occupations. Wages vary by location, experience and the particular occupation, but the majority of these jobs pay \$13 an hour or more, often much more.

District sources also pointed to a much bigger, and seemingly more entrenched, problem facing the skilled trades: poor public perception. "The word 'apprenticeship' is kind of like the word 'vocational'; it's a bad word," said Steven Rounds, project manager for tech prep programs with the South Dakota Department of Education. "If your kid is in a vocational career, he's looked down on." Maki agreed. "The whole occupational focus has changed" over the last few decades. Today, he said, people believe that "to make it in the world you have to go to [four-year] college." But a four-year degree is not the right option for the majority of people.

Jim McKeon, president and CEO of the Rapid City (S.D.) Chamber of Commerce, said he attended a meeting with about 20 community and business leaders, and there was widespread agreement about the future need for skilled trades workers. Then McKeon asked who among them was encouraging their kids to pursue such a path, "and of the 20 people in the room, not a hand went up

Trends You Can Bank On

Kiplinger's

July 2004

www.kiplinger.com

Nanotechnology has been called the next plastic or the next Internet. Through it's crucial for persons to avoid being overcome by hyperbole, nanotechnology seems destined to shape a host of industries.

Nanotechnology, the science of fabricating things at the molecular level, is a process, not a product. The name comes from the nanometer, ten of which equal the thickness of a cell membrane. Though futuristic, nanotechnology is already a part of our lives: It is used to make such products as sunscreens, car parts and clothing. The National Science Foundation says the market for nanotech products will reach \$1 trillion by 2015, spread across manufacturing, electronics, drugs aerospace and other industries.

Parts Design, Electromechanical Devices and Computer Forensics Seen as Demand Areas.

Victor Godinez

February 20, 2005

The Dallas Morning News

<http://www.dallasnews.com/>

Instead of cutting, bending or welding, advanced digital manufacturing, or ADM, drapes layers of powders, solids or liquids on top of each other to create products. "You simply put in computer instructions, and they make the parts either by adding a material or taking material away," said Dr. John Vanston, chairman of Technology Futures Inc., which prepared the report. "You can make very unusual-shaped parts this way."

Design technicians create sophisticated 3-D models of the products that ADM machines build.

According to the report, these technicians will be needed with average salaries between \$40,000 and \$50,000. "A number of companies use ADM equipment, including General Motors, Toyota, Nokia, Goodrich, NASA, Bell Helicopter, Siemens and Allegiance Healthcare," the report said.

Micro-electromechanical systems

Known as MEMS, micro-electromechanical systems are small devices as thin as a human hair that have electrical and mechanical functions. For example, MEMS dispense the ink in inkjet printers and are used to deploy air bags in cars. Digital light processors are MEMS devices that use tiny mirrors to direct the projection of light.

Marketing and Sales

Marketing and sales includes wholesaling and retailing services and entrepreneurship; professional sales and marketing; buying and merchandising; marketing communications, promotion, information management and research; distribution and logistics; and E-marketing. Direct customer service continues to be a key employment area.

- As production moves offshore, customer sales and consultation becomes more important in U.S.

Manufacturers are Expected to Contract Out More of Their Selling Duties

By Victor Godinez

The Dallas Morning News

July 16, 2004

<http://www.dallasnews.com/>

It may not be glamorous, but sales reps looking for solid, long-term job prospects might want to look at the wholesale industry. The U.S. Bureau of Labor Statistics recently published a list of what are expected to be high-earning occupations with the most job openings between 2002 and 2012.

Mr. Alpert said job seekers looking for sales positions should probably focus their efforts on wholesalers. "Job prospects are better for sales reps who work in the wholesale trade industry, compared to those who work in manufacturing, for the very reason that we're expecting manufacturers to contract out their sales duties," he said.

Pharmaceutical Reps See Perks

Susan Kreimer

September 1, 2004

The Dallas Morning News

<http://www.dallasnews.com/>

Catering to the field, universities have expanded course offerings - and in some cases, created degree programs - to prepare students for careers as pharmaceutical sales reps. One of the job's main duties is to inform doctors about new medicines that could help patients. That's a rewarding task, says seasoned rep Lisa Sewell. "It's a fabulous career," says Ms. Sewell, 36, an Austin-based national account manager for Nabi Biopharmaceuticals of Boca Raton, Fla. "It's a very stable job in the fact that it doesn't really fluctuate

with the economy. People are always sick." And the customers are interesting. "It's a job where you're dealing with an intellectual clientele."

These days, Ms. Sewell, a 13-year industry veteran, calls on managed care plans and pharmacy benefits management companies, which work together to reduce the insurers' prescription costs. They establish formularies that exclude more expensive medicines or require higher co-pays. "I go in and do a clinical presentation to those plans and show the value of the product - the efficacy of our product compared to the competitive products," said Ms. Sewell. "And if needed, we will negotiate contracts with the managed care plans, giving them further discounts."

Science, Technology

Science Technology includes providing scientific research, and professional and technical services (e.g., physical science, social science, and engineering). This includes laboratory, testing, research and development services. Bioscience and nanotechnology are areas of significant potential growth.

- Bioscience receives most attention.
- Concern expressed over numbers of grads and foreign dominance in scientists and its impact on U.S. ability to innovate and compete.

Bioscience Careers- the Next Big Thing?

By Tricia Dahlman & Kari Schuch

Minnesota Economic Trends

Fall 2004

Department of Employment and Economic Development

<http://www.deed.state.mn.us/lmi/publications/trends/>

Bioscience has received plenty of attention lately. And for good reason-the industry has seen a tremendous amount of change recently. Since 1992, the bioscience industry on the national level has more than tripled in size, and revenues have jumped from \$8 billion (1992) to \$27.6 billion (2001). From 1992 to 2001, the number of employees increased from 79,000 to 190,000. Bioscience offers career opportunities in a variety of different industries as well. More than 3 million (national) job openings are projected in three of the bigger bioscience industries through 2010: drug manufacturing, agricultural services, and health services.

No state wants to be left out of the bioscience revolution, and Minnesota is no exception. It is estimated that over 60,000 Minnesotans today work for companies with a bioscience research and production component.

Chemists Facing New Job Formula

Susan Kreimer

November 23, 2004

Special to The Dallas Morning News

<http://www.dallasnews.com/>

Growth is also emerging in molecular imaging. This allows scientists "to look inside the human body" while advancing medicine through MRI, mammography, ultrasound and other technology, said Dean Sherry, professor of chemistry at the University of Texas at Dallas and professor of radiology at UT Southwestern Medical School. "For young chemists, I think the opportunities for going into medical areas are really very, very good," he said. "We need chemists in this field."

U.S. Losing Dominance in the Sciences

Jim Boyd

December 12, 2004

NY Times

<http://www.nytimes.com/>

United States has started to lose its worldwide dominance in critical areas of science and innovation, according to federal and private experts who point to strong evidence like prizes awarded to Americans and the number of papers in major professional journals. Foreign advances in basic science now often rival or even exceed America's, apparently with little public awareness of the trend or its implications for jobs, industry, national security or the vigor of the nation's intellectual and cultural life. "The rest of the world is catching up," said John E. Jankowski, a senior analyst at the National Science Foundation, the federal agency that tracks science trends. "Science excellence is no longer the domain of just the US"

An expansion of the world's brain trust, with new approaches, could invigorate the fight against disease, develop new sources of energy and wrestle with knotty environmental problems. But profits from the breakthroughs are likely to stay overseas, and this country will face competition for things like hiring scientific talent and getting space to showcase its work in top journals.

Technology's Too-Small Sisterhood

May 12, 2004

Business Week

<http://www.businessweek.com/>

That such women are so rare may point to a future of stagnating, if not declining, female participation in the tech sector. In 1985, women received 37% of all U.S. computer science undergraduate degrees. By 2000 that had fallen to 28%. At top-tier institutions of higher learning, Whitney says, the number is now below 20%.

This is in contrast to the trend in other scientific disciplines. Women now earn more than 50% of all degrees in the biological sciences. And fields such as psychology and biology have experienced dramatic increases in female participation. "If women are earning 55% of bachelor's degrees but only 18% of engineering bachelor's degrees, that's a concern to us," says Elena Silva, research director at the educational foundation the American Association of University Women. "We still don't have a proportional number of women preparing for these positions."

Transportation

Transportation is the movement of people, materials, and goods by road, pipeline, air, rail and water and related professional and technical support services, logistics services, mobile equipment and facility maintenance. This area continues to have a high need for workers in selected occupational categories.

- Just in time inventories, foreign imports, and new business models fuel higher demand for transportation.
- Image, long hours away from home, regulations, and cost pressures create shortage of workers.

Truckers Short of Staff

Workforce.com Vol. 5 Issue 31

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<http://workforce.com>

Trucking executives are having a tough time filling jobs in the United States, according to the San Francisco Examiner. Competing industries such as construction are paying more, and driving 500 miles a day can be lonely and sometimes stressful. J.B. Hunt CEO Kirk Thompson says, "Growth...is at a virtual standstill until additional truck drivers are attracted." According to the Tulsa World, trucking companies are trying to combat the 105 to 110 percent turnover rates with higher wages and signing bonuses. But drivers are less concerned about money than about being treated with honesty and respect. Says Tulsa World: "The

dishonesty involves bonuses promised but nearly impossible to receive; pay scales or mileage promised and not received; benefits promised and either not received or drastically reduced after a period of time; drivers repeatedly having to load and unload freight after assurances that it was not part of the job; and not getting home when or as often as promised."

Aviation Jobs Go Outside Airlines

By Jamie Gumbrecht

The Dallas Morning News

<http://www.dallasnews.com/>

Even as more airline mechanic layoffs are announced, some aviation maintenance jobs are still available - but not where they used to be, and probably not as many. Major airlines still employ the most aircraft mechanics, but they've been hit hard by a flagging economy and high fuel prices.

American Airlines Inc. expects to cut about 650 mechanics in coming months, as it reduces domestic flights. With the majors more susceptible to cutbacks and layoffs, some of the jobs are shifting to smaller outside companies that repair and maintain aircraft. As a result, those maintenance providers - as well as upstart airlines and private companies using their own aircraft - are becoming the new boon for aviation technician employment. But those jobs can come with lower pay and fewer benefits than at nonunion companies.

Retirement Wave Creates Shortage of Air Traffic Controllers

Matthew L. Wald

July 20, 2004

New York Times

<http://www.nytimes.com/>

A controller shortage could become particularly acute in New York, where government statistics show that it takes longer to train apprentices than anywhere else, and where more trainees drop out than elsewhere. The F.A.A. has said that jobs in the New York area are hard to fill because controllers can earn nearly as much in other locations, where the cost of living is lower and the work is less hectic.

The retirement crunch is coming at a time of sharp growth in air traffic as the economy rebounds, and as commercial airlines are using smaller planes to add more flights and expand schedules. This saves the airlines money but makes the skies more crowded. This year the secretary of transportation, Norman Y. Mineta, called for tripling the air traffic capacity of the United States over the next 15 to 20 years to make room for more private and commercial flights, but budget cuts forced the F.A.A. to cancel some programs to let each controller handle more traffic.

At a news conference yesterday at a hotel near La Guardia, officials with the controllers' union, the National Air Traffic Controllers Association, complained that it takes a long time to train new hires because, with inadequate staffing, there is no one available to train them. And, they said, new equipment designed to speed air traffic will sit idle because there is no time for controllers to learn how to use it.

Other trends

- In spite of graduating with high education degrees, women continue to earn less than men.
- Many minority children drop out of high school in numbers far out of proportion to their enrollment.
- States who invest in higher education have dramatic and measurable impacts on both the well-being of the state, and its individual citizens.

Gender Differences in Participation and Completion of Undergraduate Education and How They Have Changed Over Time

National Center for Education Statistics

February 2005

<http://nces.ed.gov/pubs2005/2005169.pdf>

Between 1970 and 2001, women went from being the minority to the majority of the US undergraduate population, increasing their representation from 41 percent to 56 percent of undergraduates. Projections to 2013 indicate that women's undergraduate enrollment will increase to 8.9 million or 57 percent of the undergraduate population.

The majority of 1992-93 and 1999-2000 bachelor's degree recipients were employed 1 year after graduation. However, for both cohorts of college graduates, men were more likely than women to be working full time while women were more likely than men to be working part time. Among bachelor's degree recipients who were employed full-time 1 year after graduation in 1994 and 2001, women earned lower average annual salaries than men in both cohorts. On average (in 2001 dollars), women earned \$5,200 less than men in 1994, and \$6,800 less or 83 percent of male salaries in 2001.

Dropout Rate for Students of Color Has Some Concerned

Paul Tosto

February 24, 2005

St. Paul Pioneer Press

<http://www.twincities.com/>

Growing numbers of Minnesota students are stepping directly from high school into higher education, though officials say more needs to be done to get students, especially students of color, through high school. Sixty-five percent of Minnesota's 64,000 high school graduates in 2003 kept their education going, enrolling in community colleges, public and private universities and trade and vocational schools, a report released Wednesday by the Minnesota Higher Education Services Office shows. About 32,000 students continued their education in Minnesota while close to 10,000 went elsewhere.

Many minority children drop out of high school in numbers far out of proportion to their enrollment. Students of color made up 17 percent of the junior and senior high student body in Minnesota public schools in 2003 while 44 percent of that population dropped out of school, state data show.

Report Finds States' Investment in Education Pays Off

By Jennifer Burcham

Community College Times

March 1, 2005

<http://www.aacc.nche.edu/>

States who invest in higher education have dramatic and measurable impacts on both the well-being of the state, and its individual citizens, even when the workforce has at least some type of higher education, including training at community colleges, according to a new national report. The report says that the benefits of a college education include lower unemployment rates, less reliance on public aid, better health and higher voting and volunteering rates.

On a state-by-state basis, the analysis shows that almost every state benefits from higher education in every indicator, though some states benefit more than others. The percentage of workers age 25 and older who are in the labor force but not employed is an economic indicator that can be tied to higher levels of education, according to the report. For example, in March 2004, six percent of the population nationwide age 25-years-old and older with a high school diploma was unemployed, compared to only three percent for those with a bachelor's degree. In the same time period, the national average total personal income of workers 25 and older with a bachelor's degree was \$48,417, roughly \$23,000 higher than for those with a high school diploma.