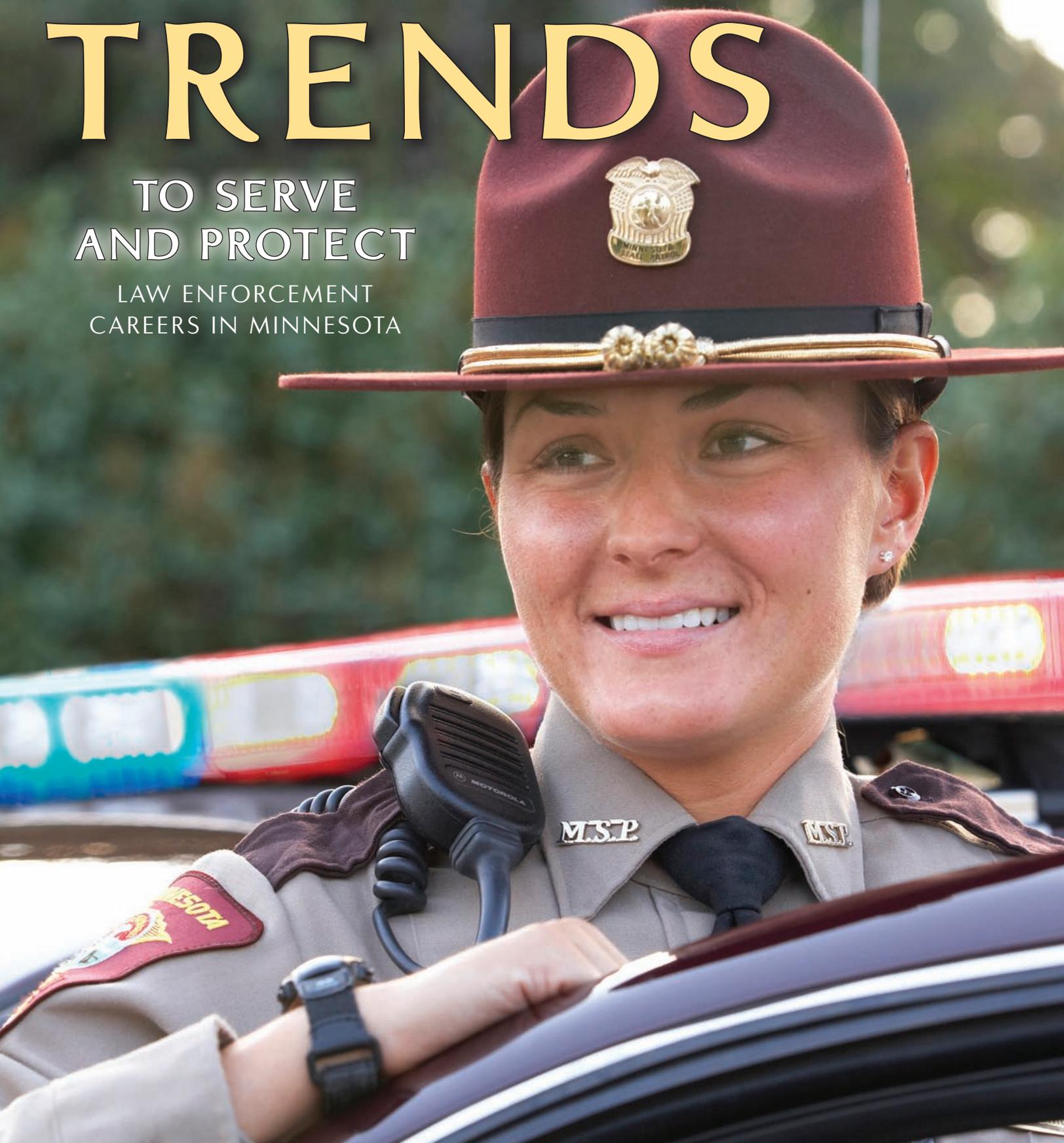


MINNESOTA ECONOMIC

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MARCH 2013

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Minnesota
Department of Employment and Economic Development

Hard-to-Fill Jobs: It's Complicated

We've heard a lot in recent years about the skills gap and the difficulties employers face in finding qualified job candidates for certain occupations. But if DEED's recent Hiring Difficulties Study is any indication, the challenge of filling skilled positions is more complex than that.

The study, released in early March by the agency's Labor Market Information Office, found that a lack of qualified job candidates is only part of the reason employers are struggling to fill some jobs. Uncompetitive wages and undesirable job locations or work shifts are among other factors.

As DEED research director Steve Hine put it, "There's no one-size-fits-all reason. It's complicated."

A story by Alessia Leibert in this issue zeroes in on one of the occupations that was examined in the study — registered nurses. According to the story, a lack of skilled candidates was a factor in a small fraction of the registered nursing jobs that health-care employers in Minnesota said were hard to fill during the period studied. Instead, less-than-attractive job, firm or industry characteristics and location mismatches were the prime factors in most of the hard-to-fill openings for registered nursing, according to Leibert.

This isn't the last time you will hear about this research. DEED analysts examined five other occupations during the study and are already working on a second round of employer interviews that will look at other occupations.

This issue's cover story by Mark Schultz and Rachel Vilsack looks at careers in law enforcement in Minnesota, focusing on people who work in that sector and examining the outlook for jobs. Elsewhere, Brent Pearson looks at hiring demand for welders in southern Minnesota, while Amy Gehring reviewed data to find out what happened to nearly 78,000 students who attended Minnesota community and technical colleges in the fall of 2009 but didn't return the following fall. Finally, Dave Senf contributes a story that looks at how employment has shifted in certain occupations in recent years.



Monte Hanson
Editor

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Protecting Minnesota

Law enforcement professionals, from police officers to correctional caseworkers, say strong communication skills are essential to succeeding at the job.

About 17,000 people work in law enforcement in Minnesota, often facing heavy workloads and high stress. For law enforcement professionals, the opportunity to help society and work with offenders makes the job of enforcing Minnesota's laws and protecting citizens worth it.

One of those law enforcement professionals is Matthew Mork, who said making his career choice was easy.

"My father was in law enforcement for 30 years. I was always proud of him for what he did, and it's all I've ever wanted to do," he said. "It's a job with a purpose and a meaning."

Mork works for the Sherburne County Sheriff's Office as an investigator and emergency response unit team member. The average citizen would think of him as a police officer.

"I drive with red lights and sirens to get to situations that most people run away from," he said. "It is my responsibility to intervene and protect those in need."

The first encounter many people have with law enforcement — and the criminal justice system — is often through a police officer. About 8,250 people work as police and sheriff's patrol officers in Minnesota, protecting life and property by enforcing local, tribal, state or federal laws and ordinances. Strong interpersonal skills are critical in the job, and physical work conditions are the norm.

"I interact with people of all temperaments and need to be able to talk with them in a professional manner, regardless of how they talk to me," Mork

said. "It is also very important to be able to remain calm during pressure situations and to be able to react confidently without hesitation."

To prepare for his career, Mork earned a bachelor's degree in law enforcement from Minnesota State University Mankato. In Minnesota, a two- or four-year degree is required for police officers, and gaining a license requires a 10-week skills course approved by the Minnesota Board of Peace Officer Standards and Training.



PHOTO COURTESY DEPARTMENT OF PUBLIC SAFETY

The median wage for police and sheriff's patrol officers varies from \$21.85 per hour in southwestern Minnesota to \$32.06 per hour in the Twin Cities. The Bureau of Labor Statistics reports that jobs in state and federal agencies will be competitive because they offer high pay and more opportunities for promotion. Bilingual applicants with law enforcement degrees or military experience, especially investigative experience, will have the best opportunities in federal agencies.

The need to replace retiring police and sheriff's patrol officers will drive future job prospects in Minnesota, where it's estimated that 3,000 new and replacement job openings will be available between 2010 and 2020.

Mork acknowledges that some aspects of his job are difficult to deal with, like responding to calls involving death and the long and irregular work hours.

"The hours can be hard on family life," he said. "You end up working late often or working holidays and missing family functions."

But the positives outweigh the negatives, he said. "I don't know a better way to say it, but there is an absolute satisfaction in helping the good people and putting the bad guys in jail."

Behind Bars

Most offenders held in jails and prisons in Minnesota will meet someone in Shawn Yurick's position. Yurick is a correctional officer at the Minnesota Correctional Facility in Stillwater.

Correctional officers and jailers guard inmates in penal or rehabilitative institutions and assist in the transfer of prisoners between jail, courtrooms and prison. Nearly 5,000 people work as correctional officers in Minnesota at federal, state and local institutions, earning an average wage of \$21.61 per hour. Replacement workers will be needed as current correctional officers retire or otherwise leave the profession.

Yurick has worked as a correctional officer for 21 years in both Arizona and Minnesota, although he studied at the Culinary Institute of America. In the early 1990s, he found the career after looking for an opportunity with steady pay and good benefits.

"Back then Arizona was hurting for corrections officers; they were taking any able-bodied person. I had no experience and after the first year came to see that I was a good fit for this type of work," he said.



PHOTO COURTESY DEPARTMENT OF PUBLIC SAFETY

According to Yurick, people interested in a correctional career should possess excellent communication skills, along with situational awareness (knowing what's going on around them) and self-awareness (knowing their abilities and limitations).

Yurick enjoys the security of his career, but noted it's not always easy to quantify the job's impact.

"Because I do not produce anything, the feeling of accomplishment is an intangible idea that I continually need to work on," he said. "At the end of the day all inmates are accounted for, and the public and my coworkers are safe."



PHOTO COURTESY DEPARTMENT OF PUBLIC SAFETY

“When I go home the job stays behind walls, and when I walk back in the next day, home life stays home,” he said. “You do not get that with most jobs.”

Abby Domagalski also works at the Minnesota Correctional Facility in Stillwater. She has a bachelor’s degree in criminal justice from Minnesota State University Moorhead, with an emphasis in sociology.

“Ever since I can remember, I have been totally fascinated by the criminal mind,” she said. “Until I began working in a prison setting, I had never truly realized the vast devastation that is caused by criminal behavior.”

As a corrections security caseworker, Domagalski has the opportunity to know offenders, from their crimes to their family histories and how they were raised.

“When you see the home lives that a lot of offenders were raised in, it is easier to see why they ended up in prison, and I can be a bit more empathetic,” she said.

It’s this background information that Domagalski can use to assist offenders so that they will be successful when they leave prison.

“It’s so easy to say that a lot of the offenders we work with will be incarcerated again

sometime in the future,” she said. “Caseworkers are one of the few positions in the prison that can work one-on-one with offenders and actually may make a difference in helping an offender not return to incarceration.”

For a correctional caseworker, communication skills are crucial.

“You have to be able to speak to both offenders within the prison, as well as families and victims in the community,” she said. “It can be tricky because they are obviously two very different populations.”

The number of offenders assigned to a correctional caseworker can be high. Domagalski is responsible for 105 to 113 inmates at any given time, which can be overwhelming and lead to burnout.

“We are also each expected to take on extra duties outside of our primary positions,” she explained. “For instance, I do the receiving and orientation class, which is a one-hour course that all offenders must attend within two weeks of arriving at the facility.”

Reading about some of the crimes committed by offenders can take its toll, she said, but it’s important to be able to separate yourself from the job.

Spotlight on Law Enforcement Careers

Sarah Velander

Job: Clinical program therapist

Employer: Minnesota Correctional Facility – Faribault

Education: Bachelor of science degree, licensed alcohol and drug counselor

Key skills: Patience, open mindedness, ability to look at the person and not the crime

What trends do you see? An under-diagnosis of mental health issues and the significance of generational trauma for African American and Native American men; there is a need for trauma- informed services for all.

Sgt. Doug Stokes

Job: Shift commander

Employer: Winona County Sheriff

Education: Bachelor's degree, Wisconsin police training, Minnesota SKILLS training

Key skills: Problem solving, organization, listening, interpersonal communication, teamwork

What trends do you see? Drug courts seem to be the new trend in Minnesota. A different court system has been created to focus more on the rehabilitation of non-violent drug users. In effect, more treatment or probation options rather than incarceration.

Brian Gaddis

Job: 911/radio communications operator

Employer: Minnesota State Patrol

Education: High school graduate, plus one year of college

Key skills: Multi-tasking, stress management, customer relations, basic computer aptitude

What trends do you see? Texting while driving is the most recent traffic epidemic. According to the National Highway Traffic Safety Administration (NHTSA), more than 3,000 people were killed in 2010 in crashes involving distracted driving.

“It can also be hard to remain positive when dealing with an offender who will never go home,” she said. “What can you possibly tell him to get him to think positive when he has nothing to look forward to?”

Back on the Street

When offenders are released, they may meet Jeff Harris, who is a corrections agent — or probation officer — for the Minnesota Department of Corrections in Wabasha.

Probation officers assist offenders who are sentenced to probation, offering services such as housing and employment, all with the goal of helping to prevent future crimes. They also monitor their clients to verify they are meeting the conditions of their probations and routinely update case files for the court. Minnesota has 1,500 probation officers and correctional treatment specialists — including Domagalski’s profession — earning an average wage of \$30.60 per hour. Job prospects will continue to be good, with an estimated 620 job openings projected in Minnesota between 2010 and 2020.

A career in law enforcement wasn’t Harris’ first aspiration.

“I started college with the idea of being a teacher. I had a lot of

friends who were going into law enforcement,” he said.

After taking and enjoying a sociology class, Harris switched his major to law enforcement and graduated from Winona State University with a bachelor’s degree in criminal justice.

“I wasn’t sure if I wanted to be a police officer or a probation officer. I did ride-alongs with both and thought that probation seemed like a better fit for me.”

“I think the biggest skill for a probation officer is the ability to communicate with everyone in the system,” he said.

This includes effective verbal communication with co-workers and offenders, but also written communication. Probation officers record daily interactions with clients on the computer and produce written reports for the court.

“I like the ability to communicate with people and attempt to make some positive change for the offender.”

Harris said that it is also important to build relationships and stay organized. This is especially important in a job where no two days are the same.

Harris, who is marking his 10-year anniversary in state law enforcement this year, noted there are challenges to a career in probation, particularly when the positive changes that one hopes to see in an offender don’t occur, despite a lot of hard work.

“I like the challenge,” Harris said. “There are many days where we go to work with a plan of what we want to get done, but for some reason or another it doesn’t happen. It is not your typical 9 to 5 job.”



PHOTO COURTESY DEPARTMENT OF PUBLIC SAFETY

Matching Workers with Registered Nurse Openings: Are Skills Scarce?

A new DEED study found that a lack of skilled candidates is a small factor in the inability of employers to fill openings for registered nurses. Unfavorable characteristics related to the job, firm or industry and geographic mismatches are often bigger contributors to hiring challenges in the field.

Skills mismatches occur when there is a gap between supply and demand for a particular skill, resulting in unfilled job vacancies and significantly slower hiring. Where skill gaps do, in fact, result in inadequate staffing, additional workforce training or education could spur economic growth. There are other reasons, however, that vacancies may go unfilled, including factors unrelated to the candidate pool such as uncompetitive compensation packages, ineffective recruitment strategies and unattractive job requirements.

Where skills are scarce we expect to see hiring difficulties across a variety of industries, regions, and job characteristics for vacancies within the same occupation. Moreover, we would expect jobs requiring more skills and experience to be harder to fill overall than entry-level jobs within the same occupation.

DEED's Hiring Difficulties Survey last fall looked at employers' perceptions of hiring difficulties by occupation and compared them with a variety of firm and job characteristics. Six occupations were chosen based on available anecdotal evidence of hiring difficulties. This article, focusing on survey findings for the registered nurse (RN) occupation, is the first in a series of reports on different occupations.

A summary report on the first round, including findings for all nine occupations surveyed, is available on the DEED website at www.tinyurl.com/HiringDifficultiesStudy.

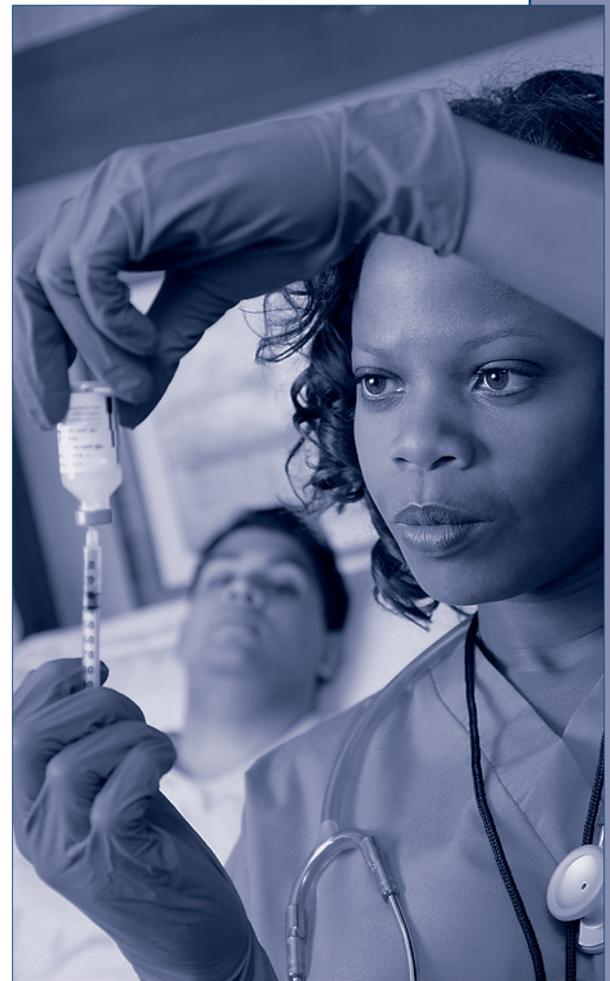
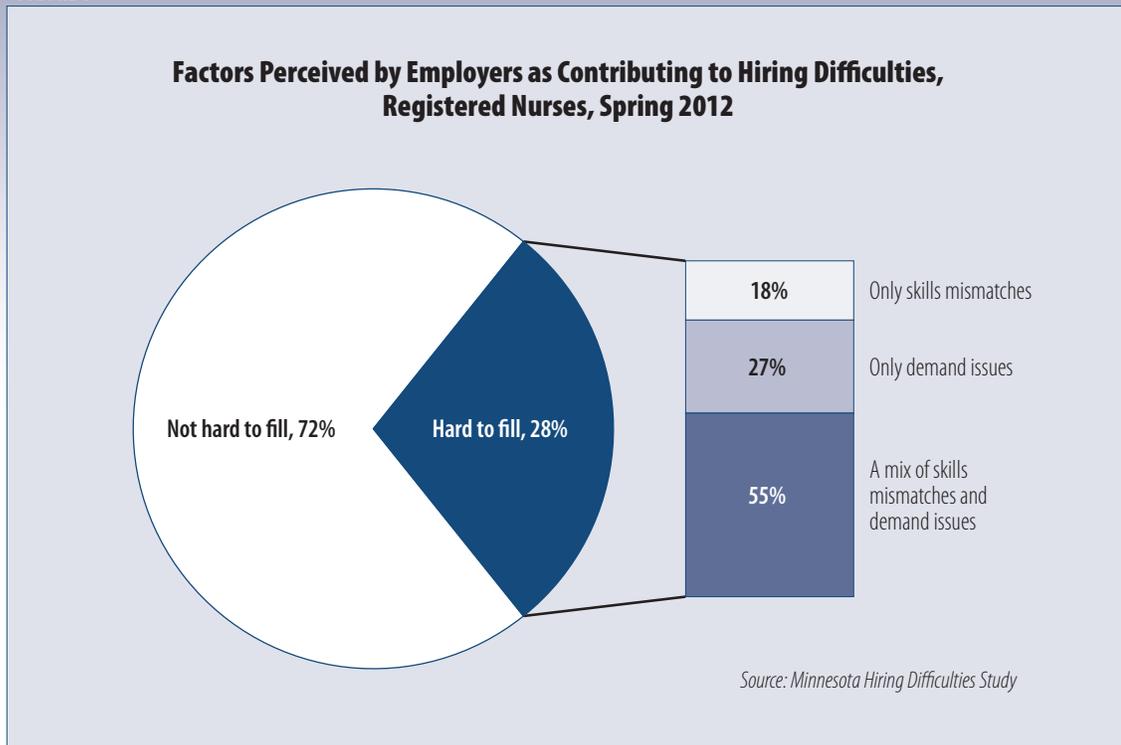


FIGURE 1



Are Nursing Positions Hard to Fill?

In order to identify hiring difficulties, employers were first asked the following question: “Did you have/Are you having difficulties filling the position?” Those who reported difficulties were asked to identify the reasons. Was hiring difficulty driven by a lack of training, skills or experience of applicants or demand factors unrelated to the candidate pool, including unattractive work hours, wages or geographic location?

As illustrated in Figure 1, 28 percent of RN vacancies were reported as hard to fill during second quarter 2012. This section will focus on this group of RN vacancies.

According to the human resource professionals who were interviewed, skills deficiencies rarely occur in isolation from demand-side factors. Of the hard-to-fill vacancies, only 18 percent fell into this category exclusively because candidates did not have the qualifications required. The majority, 55

percent, fell into this category due to a combination of skills mismatches and unattractive demand characteristics.

Moreover, when skills mismatches were cited as a problem, employers cited insufficient experience in a specific role or industry rather than insufficient formal education in the candidate pool. The following quotes illustrate this finding:

- “Candidates had the years of experience as an RN, but their experience was in long-term care facilities, not in a hospital, and that’s a different animal.”
- “We sometimes get nurses who work in the home and are not required to do case-management, and thus lack the skills we need to do prompt and efficient paperwork.”
- “Dialysis and ICU experience are hard to find.”

If the problem is a mismatch between the experience requirements of vacancies and the experience profile of the candidate pool, the solution is not more schooling but more cross-functional work-based learning to increase the transferability of skills.

When demand-side factors were cited as a problem, undesirable location was most frequently mentioned, followed by uncompetitive wages or compensation in general, work shifts and competition from other employers who invest more resources in attracting candidates. The following quotes illustrate this point:

- “From this area people can easily commute to the metro area or to Rochester where there are a lot of other job opportunities.”
- “We are located in a rural area and it is hard to get people to relocate.”
- “Some candidates do not like having to drive to see patients.”
- “Our industry has a much lower wage base than others. So perhaps the reason we can’t get enough applicants is that everybody knows the pay is \$10-a-day lower.”
- “We can’t compete with places that offer high hiring bonuses.”
- “The position has 10-hour shifts, which are tougher to fill.”
- “Every few years, when hospitals start hiring, we have a hard time filling nurse positions. We’ve lost a lot of our nurses to hospitals.”

Recruiters are very much aware of what else could be done to improve the quantity and quality of the

applicant pool. In fact, the strategies they’ve used in the past, and plan to use if hiring difficulties persist, address precisely these issues. Here are some insightful ideas collected from respondents:

- Rethink the experience requirements of the position: Are they truly necessary? Can we loosen them?
- Rethink the staffing mix: Can we start hiring staff who are cross-trained so we have a number of people who can take some of the responsibilities of the position while we train the new hire?
- Rethink shifts and schedules: Can we spread the least attractive shifts across more positions in the unit so that one person does not have to handle too many of them?
- Rethink recruitment strategies: Can we offer hiring bonuses to talented applicants or referral bonuses to our staff? Can we recruit from local schools or from organizations that are affiliated with the type of care we are delivering?¹



TABLE 1

Incidence of Hiring Difficulties in RN Vacancies by Firm and Job Characteristics, Spring 2012 ¹		
Factor	Categories	% Hard to fill
Location of Firm**	Metro area	22
	Greater Minnesota	34
Size of Firm**	Small: Fewer than 50 employees	1
	Medium: 50 to 249 employees	52
	Large: 250 or more employees	30
Industry of Firm**	NAICS 621 Ambulatory Health Care Services	27
	NAICS 622 Hospitals	37
	NAICS 623 Nursing and Residential Care Facilities	47
	Industries outside of health care	7
Job Experience Requirements**	No experience required (entry-level)	47
	Experience of less than three years	19
	More than three years of experience	60
Job Education Requirements*	Associate degree	27
	Bachelor's degree	34
** strong factor * weak factor		
¹ The model was able to correctly predict the presence (or absence) of a hiring difficulty in 84 percent of survey data, with a Nagelkerke R Square of .526. The following variables were included in the model: geography (six Planning Regions), firm size, industry, experience, education and interactions between industry and experience level.		

Source: Minnesota Hiring Difficulties Study

Most hiring difficulties did not prevent employers from successfully hiring. Fifty-six percent of positions reported as hard to fill were successfully filled by the time the interviews were conducted, about three to eight months after the job was posted.

Overall, survey results suggest that the difficulties employers face in finding adequately prepared candidates are strongly dependent on demand characteristics.² The next section of the article explores these demand characteristics and their ability to explain hiring difficulties.

Underlying Causes of Hiring Difficulties

Table 1 categorizes firm and job factors associated with hiring difficulties as determined by the actual explanatory power they show when they are included in a model that predicts the probability of a vacancy being hard to fill. This analysis of 893 estimated RN vacancies reveals that factors such as firm location, firm size and industry strongly affect the probability of a job being hard to fill.

Hiring Difficulties Survey Quick Facts

Data collection method: in-depth phone interviews with employers who reported RN vacancies as part of the Minnesota Job Vacancy Survey, second quarter 2012.

- 100 establishments with 893 RN vacancies responded, representing a 78 percent response rate.
- Data collected for each establishment: geographic location, industry classification, employment size.
- Data collected for each job vacancy: number of openings, experience level, education level, part-time status.
- Survey questions for the measurement of hiring difficulties:

1. Did you have/are you having difficulties filling this position?

**2. If yes, are these statements true or not for this position?
(Check all that apply.)**

- a) There weren't enough applicants with the right type of *education or training*.
- b) There weren't enough applicants with the right *skills, knowledge, or experience*.
- c) The hiring difficulty was related to the *wage* being offered.
- d) The hiring difficulty was related to the *geographic location* of the work.
- e) The hiring difficulty was related to the *hours or shifts of work*.

The effect of each factor is explained below.

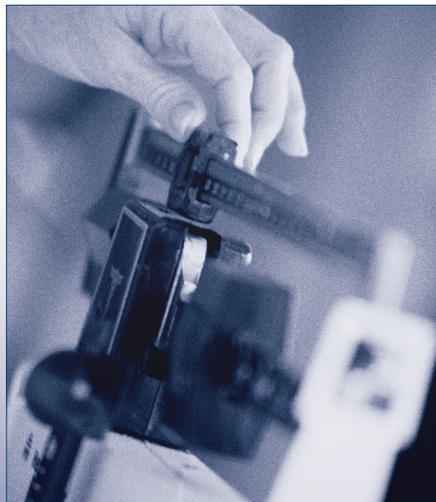
Geographic location: The data show that the probability of a job being hard to fill increases by a factor of 8 in Greater Minnesota compared with the metro area.

Firm size: The probability of a job being hard to fill increases by a factor of 4 in mid-sized firms compared with large firms. Large health care establishments definitely have a recruiting advantage because they can advertise more, offer higher wages and learning opportunities, as well as hiring bonuses and other incentives to relocate. So firm size appears to be a proxy for compensation and other aspects that make a vacancy more or less attractive to applicants.

Industry: Results show that, compared with jobs in nursing care facilities, the probability of a vacancy being hard to fill

decreases to almost zero (.04) if it occurs in ambulatory services or in industries outside of health care, and to one-third (.38) in hospitals. Although the effect of wage offers on hiring difficulties could not be measured,³ wage might be one of the reasons some industries are experiencing significantly more hiring difficulties than others. For example, long-term care facilities may have difficulty attracting and retaining nurses in part because they are not reimbursed at the same rates as hospitals and cannot always offer competitive wages. But compensation is not the only issue. Industry captures other underlying factors that influence a nurse's choice of where to work, including schedules, types of patients served, career development opportunities, etc. For example, ambulatory surgery centers might be less likely to experience hiring difficulties because of lower stress levels and no night, holiday or weekend shifts.

Entry-level versus experienced jobs: The probability of a job being hard to fill drops to one-seventh (.14) if the job requires intermediate or high experience compared with no experience. Besides ambulatories and industries outside of health care, where high experience vacancies were fewer and harder to fill than others, nursing positions requiring experience generally are easier to fill than those requiring no experience. This finding undermines the argument of a skills gap in the RN occupation in that we would expect to see an increase in hiring difficulty in vacancies requiring higher levels of skill (including experience). It is important to note that employers are, in general, reluctant to train entry-level nurses because it entails additional resources including staff time of experienced RNs. It appears that many employers look for experienced candidates to fill even entry-level positions, which



may explain some of the hiring difficulty associated with entry level RN positions.

Associate degree versus bachelor's degree jobs:

Post-secondary education and licensure are absolute requirements for work in the RN field. Therefore, the education system plays an essential role in ensuring an adequate supply of new nursing graduates to meet growing levels of demand. Although some employers prefer a bachelor's over an associate degree, most look only at the RN license. Therefore, adding years of education beyond a license may not ease hiring difficulties. This finding provides evidence against a widespread skills gap for RNs.⁴

Conclusions

Poor supply of skills is the root cause of only a small fraction of hiring difficulties in the RN occupation. The quantitative analysis reveals a multitude of potential causes that, at a minimum, cautions against drawing conclusions about talent shortages. Hiring difficulties

definitely occur, but they seem to be driven primarily by less-than-attractive job, firm or industry characteristics and location mismatches (demand-side factors), rather than by the lack of available occupational skills in the workforce. Quantitative evidence is also consistent with employers' perceptions of a complex mix of contributing factors. Because experience is such an important component of RN skills, both job seekers and employers have a role to play in closing the skills gap. Job seekers may be well guided to take less than ideal jobs in order to obtain experience. On the other hand, employers who do not offer meaningful development opportunities to their nursing workforce are at risk of losing the talent race. If the goal is to match workforce skills with employers' needs, both sides will have to adjust their expectations and commit to work-based learning. **■**



¹One respondent who experienced hiring difficulties commented: "We think it might help to utilize some of our education partners and target schools to see if they have students that are interested in applying. Since part of the issue is our location (hard to get people to relocate or travel), it might help to target the schools in the area."

²The difficulties firms face in finding an adequate candidate pool also appear to be driven, in part, by ineffective recruiting strategies and by historically low geographic mobility of the workforce as a consequence of the real estate crash, but these aspects go beyond the scope of our survey.

³The effect of wage offers could not be measured because most employers can increase or decrease it as a response to anticipated market conditions. Thus, it is simultaneously a cause and an effect of hiring difficulties.

⁴This article focuses on registered nurses. Other nursing occupations requiring schooling beyond a bachelor's degree (nurse anesthetists and nurse practitioners) were not included in the analysis.

When Sparks Fly

Demand for welding-related jobs in Minnesota is high, with projections indicating above-average growth in the field through the end of the decade.

Employers, particularly in southern Minnesota, have been voicing concern about the supply of welders for several years. Whether that is because of a skills gap in the occupation or due to other factors is uncertain. One thing is clear, though: With above average wages and wage offers, strong job demand statewide and low education requirements, welding is a career

worth exploring for people with an interest in making things and working with their hands. Still, employers likely will have to take an active role if they want a trained and prepared workforce to fill future vacancies.

Demand

Demand for welders is high. Welders, cutters, solderers and

brazers ranks 23rd among more than 600 occupations for employer demand.¹ Results from Minnesota's Job Vacancy Survey indicate that demand has picked up again since the recession. In the second half of 2010, the number of vacancies as well as the vacancy rate began to rise, although in 2012 both of these indicators leveled off somewhat.

Wage offers move up and down in this occupation, as can be seen in Table 1. This is based in part on the level of education and experience required by the welders, cutters, solderers and brazers vacancies reported. For example, wages and post-secondary educational requirements were significantly lower for the vacancies reported during second quarter 2012 (61 percent required post-secondary education) compared with fourth quarter 2012 (89 percent required post-secondary education). This also indicates that employers pay a premium for education and experience in this occupation.

TABLE 1

Job Vacancies: Welders, Cutters, Solderers and Brazers

Year	2nd Quarter			4th Quarter		
	Vacancies	Vacancy Rate	Median Hourly Wage Offer	Vacancies	Vacancy Rate	Median Hourly Wage Offer
2012	159	2.2%	\$14.36	166	2.3%	\$16.39
2011	395	5.3%	\$14.83	381	5.1%	\$16.51
2010	65	0.8%	\$12.68	206	2.4%	\$14.42
2009*	69	0.7%	\$15.00	13	0.1%	\$14.42
2008	199	2.3%	\$15.00	127	1.5%	\$16.00
2007	160	1.8%	\$12.50	148	1.6%	\$14.42
2006	398	4.5%	\$14.35	212	2.4%	\$13.00
2005	524	5.9%	\$20.00	328	3.5%	\$16.00
2004	406	4.3%	\$11.00	209	2.3%	\$12.00
2003	73	0.9%	\$19.00	189	2.0%	\$13.94
2002	87	1.0%	\$12.00	112	1.3%	\$14.00

*There is a break in the wage offer series between 2009 and 2010 due to a change in the estimation procedure.

Source: Job Vacancy Survey Minnesota Department of Employment and Economic Development

TABLE 2

2nd Quarter 2012 Manufacturing Employment					
Region	Employment				Location Quotient
	Manufacturing	Total, All	Percent Manufacturing	Welders, Cutters, Solderers and Brazers	
EDR 1 – Northwest	7,518	37,250	20.2%	420	4.19
EDR 6E- Southwest Central	10,054	51,545	19.5%	410	3.04
EDR 9 – South Central	19,255	102,581	18.8%	390	1.42
EDR 8 – Southwest	10,038	54,293	18.5%	330	2.24
EDR 10 – Southeast	36,618	233,872	15.7%	730	1.17
EDR 7W- Central	23,241	158,877	14.6%	700	1.59
EDR 6W- Upper Minnesota Valley	2,472	18,334	13.5%	120	2.43
EDR 4 – West Central	11,406	86,142	13.2%	480	2.14
EDR 7E- East Central	4,912	46,149	10.6%	220	1.81
EDR 11 – 7 County Twin Cities	161,907	1,597,543	10.1%	2,920	0.65
EDR 5 – North Central	5,994	60,582	9.9%	210	1.27
EDR 2 – Headwaters	2,211	29,918	7.4%	50	0.63
EDR 3 – Arrowhead	9,001	139,177	6.5%	340	0.87

LQs represent employment concentration in a region compared with employment concentration nationally. An LQ of 1.0 translates to a ratio of 1-to-1, meaning an occupation is as equally concentrated in the region as in the rest of the U.S. Above 1.0 equals greater concentration, below 1.0 equals less concentration.

Source: DEED Quarterly Census of Employment and Wages, Occupational Employment Statistics

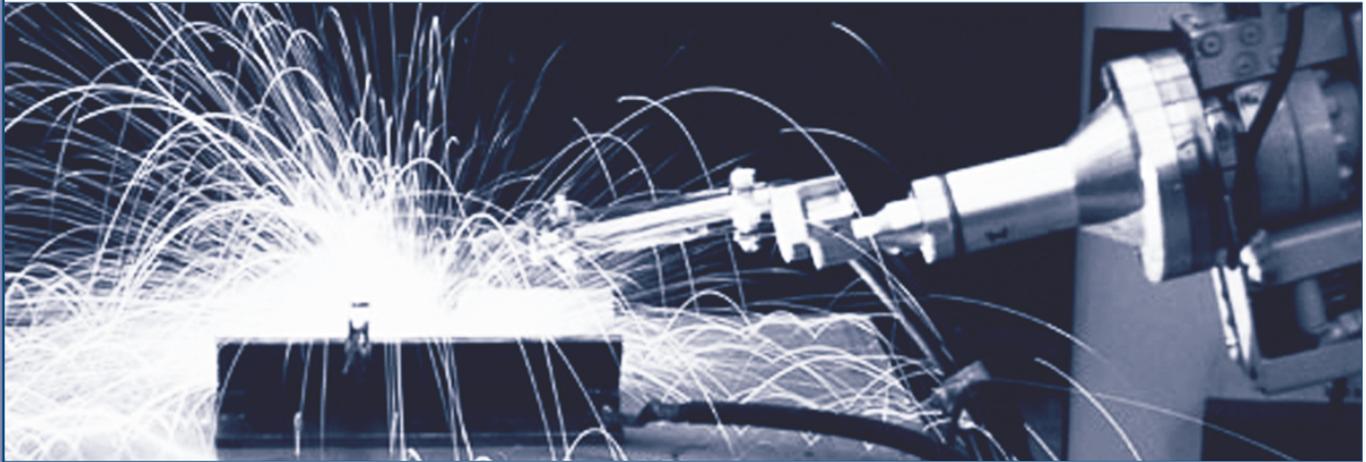
The long-term outlook in the field is also good, with projected growth well above average between 2010 and 2020.

If there is a mismatch between supply and demand for welders, cutters, solderers and brazers, it is likely to be highest in areas where the concentration for this occupation is greatest. Although location quotients (LQs) generally are used to

compare relative concentrations of employment by industry, they can also be used to compare relative concentrations of employment by occupation. As Table 2 shows, LQs for welders, cutters, solderers and brazers are relatively high in most regions of Minnesota (anything over 1.0 is more highly concentrated than nationwide). This includes all of southern, central and northwestern Minnesota.

Supply

Although most employed welders, cutters, solderers and brazers have no formal training past high school, requirements are changing quickly. The latest data available show that 89 percent of job vacancies require post-secondary education and 16 percent require a certificate, although as noted above this varies from quarter to quarter.



Overall, however, the majority of vacancies in the field over the past two years have required post-secondary education and some work experience. Most post-secondary education programs in welding last one or two years, and many programs in Minnesota offer a certificate. Programs for welding exist in every economic development region in Minnesota.

While the educational requirements are not extensive and the opportunity to pursue these educational programs is available throughout the state, the fact that the majority of welders, cutters, solderers and brazers job vacancies require work experience is a major barrier to entry into the occupation. There are several apprenticeship programs in

welding, but these certainly do not provide sufficient opportunity to train all the welders needed in Minnesota. If employers need experienced welders, they must take a more active role in providing opportunities for apprentices, internships and on-the-job training in this high-demand occupation. [T](#)

¹Based on *Occupations in Demand, DEED*.

After the Classroom

Of the 134,215 students who enrolled in classes at Minnesota community and technical colleges in the fall of 2009, nearly 60 percent did not return to classes at those schools the following fall. DEED took a look at how they fared professionally afterward.



Minnesota has 30 two-year community and technical colleges (CTCs) spread over 47 campuses statewide. These colleges, part of the Minnesota State Colleges and Universities system (MnSCU), offer general education and career-related associate degrees, certificate programs of up to two years and non-award programs. They have the highest number of enrolled post-secondary students of any

college or college system in Minnesota. During the 2009-10 school year, 134,215 students were enrolled in a Minnesota CTC, taking more than 835,000 credits in the fall semester.

Of the students who enrolled at CTC institutions in the fall of 2009, 77,805 (58 percent of the total) did not return to a Minnesota post-secondary institution the following fall.

This article will look more closely at that group of students and explore what they were doing after spring of 2010.

Study Group

The study group was 57 percent female and 76 percent white. African American students made up the second-largest racial group, accounting for 9 percent of the students. The vast majority (92 percent) were resident students paying in-state tuition. Just over half (51 percent) of the study group was enrolled full time.

Over half (55 percent) of the study group was enrolled at a CTC in the Twin Cities. The area with the next largest group was northwestern Minnesota, with 13 percent of the students. The Twin Cities was also where a majority of the traditional-aged students attended school. Students 25 and older are considered nontraditional and made up just under half of the study group. Older students were



TABLE 1

Top 10 Programs of Study	
Count	Program
21,554	Liberal Arts and Sciences/Liberal Studies
4,828	Nursing/Registered Nurse (RN, ASN, BSN, MSN)
3,200	Licensed Practical/Vocational Nurse Training (LPN, LVN, Cert., Dipl, AAS)
2,081	Business Administration and Management, General
1,564	Accounting
1,446	Criminal Justice/Police Science
1,043	Computer Systems Networking and Telecommunications
830	Criminal Justice/Safety Studies
746	Engineering, General
710	Marketing/Marketing Management, General

Source: Minnesota Office of Higher Education

more likely to be attending school in southwestern or southeastern Minnesota, while students younger than 19 were more likely to be in a school in northwestern and northeastern Minnesota.

Three-quarters (77 percent) of our study group identified a course of study and declared at least one major. This may be the best, although far from perfect, measure we have of student intention. Table 1 shows this group’s top 10 programs of study.

Employment and Education Outcomes

About 10 percent of the study group (7,455 students) received an award or degree in the 2009–10 school year. Chart 1 breaks these awards into four categories: associates degree, certificate award of less than one year, certificate award of one to less than two years, and other.

Women were a larger share of the graduates (63 percent) than men in our study group. The racial makeup of graduates, however, did not differ significantly from the distribution in the total population, nor did citizenship status. Most of these graduates (93 percent) identified themselves as degree-seeking. The remaining 7 percent of graduates in the study group did not claim to be degree-seeking.

How many of our total study group had found employment by the fourth quarter of 2010? Of the original 77,805 students, 76,554 or 98 percent have valid Social Security numbers in our databases that can be used to link to wage records. Of these, 50,361 (two-thirds) were employed in Minnesota during fourth quarter 2010. Another 143 were employed in other states.¹ Most of those who were working did not graduate from their programs (see Chart 2). Another 7 percent graduated

CHART 1

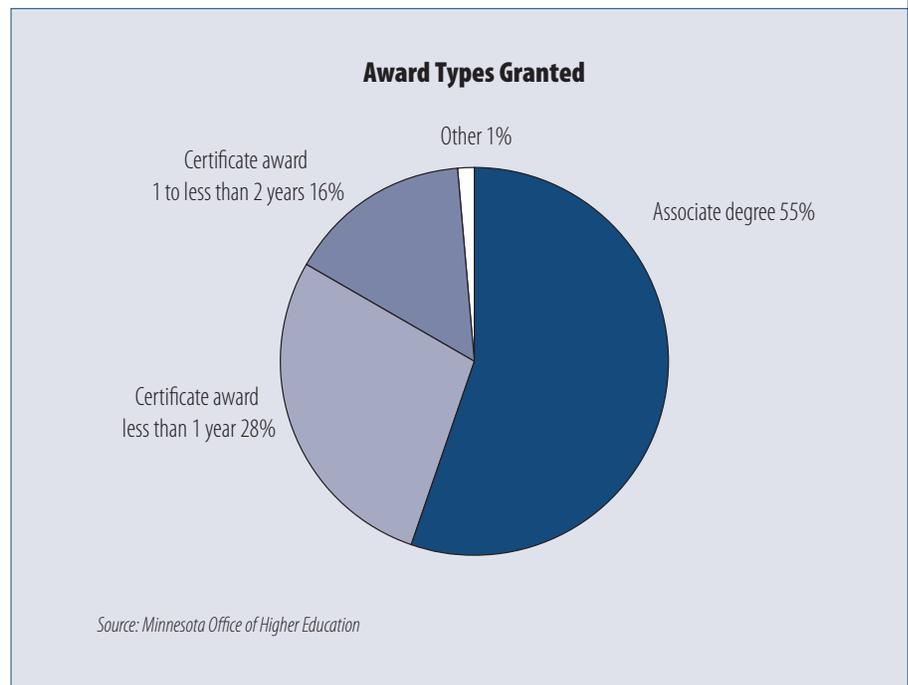


CHART 2

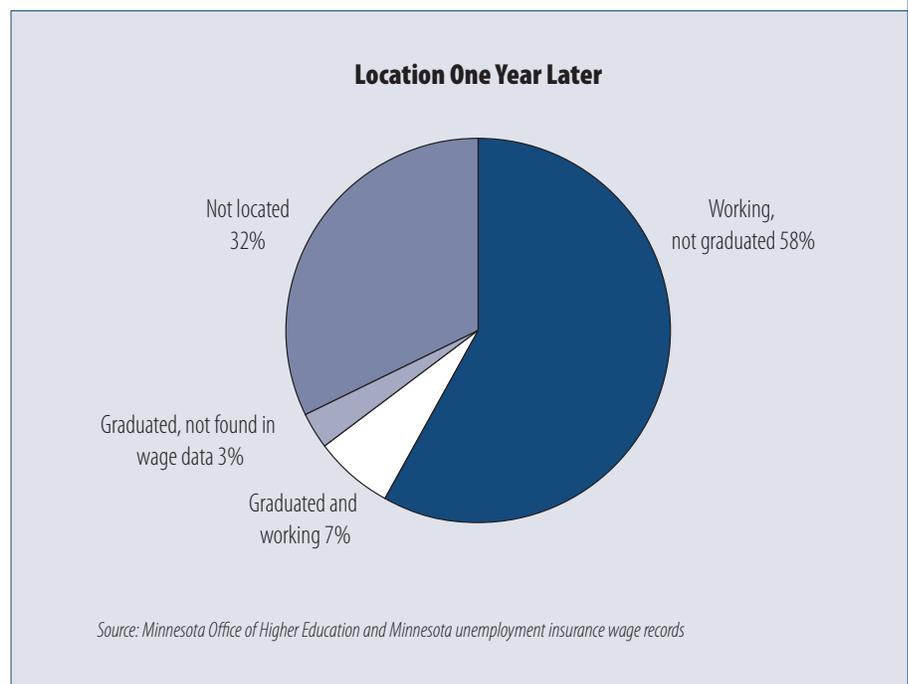


TABLE 2

Wage Outcomes for Top 11 Programs of Study					
Program	Number Enrolled	Graduates	Number Employed	Median Quarterly Wage for Graduates	Median Quarterly Wage for Non-Graduates
Liberal Arts and Sciences/Liberal Studies	21,554	1,407	14,970	\$3,629	\$3,215
Nursing/Registered Nurse (RN, ASN, BSN, MSN)	4,828	949	3,759	\$4,185	\$4,566
Licensed Practical/Vocational Nurse Training (LPN, LVN, Cert., Dipl, AAS)	3,200	275	2,303	\$3,571	\$3,889
Business Administration and Management, General	2,081	225	1,485	\$6,966	\$4,559
Accounting	1,564	128	1,043	\$5,439	\$4,597
Criminal Justice/Police Science	1,446	123	1,040	\$4,959	\$3,538
Computer Systems Networking and Telecommunications	1,043	42	628	\$5,895	\$4,353
Criminal Justice/Safety Studies	830	41	556	\$4,824	\$3,860
Engineering, General	746	51	444	\$2,056	\$3,453
Marketing/Marketing Management, General	710	72	542	\$6,756	\$3,976
Automobile/Automotive Mechanics Technology/ Technician	706	23	431	\$2,843	\$3,182

Source: Minnesota Office of Higher Education and Minnesota unemployment insurance wage records

and found work, and 3 percent graduated but do not appear in the Minnesota wage data or the wage data that we have access to for other states. In summary, one-third of these former students cannot be located in the graduate listings, Minnesota wage data or wage record data for the other 22 states that participate in the wage records interchange system.

Wage Outcomes

This section compares wage outcomes for those in our study group who graduated and those who did not graduate. Table 2 displays the top 11 programs of study by enrollment in fall 2009 along with the number of graduates, the number employed in fourth quarter 2010 and the median quarterly wages for both graduates and non-graduates in our study group.

For these 11 programs, graduates earned an average of \$721 a quarter more than those who did not graduate. But in programs for registered nurses (RNs), licensed practical nurses (LPNs), engineers and automotive

mechanics, graduates earned less on average than non-graduates. What is the explanation for this?

One likely possibility is that many of these students were already employed in the profession when they enrolled in school. They went back to school either to enhance their existing skills or to learn new ones, not to receive a degree or obtain a license to practice.

An examination of RNs in the study group verifies this theory. It is clear from wage record data over a three-year period prior to 2009 that non-graduate RNs had been working with their employers in the health care industry for an average of three years longer than graduates in our study group. Since RNs need at least a two-year degree and a license to practice, we can assume that the vast majority of RN non-graduates already were working as RNs prior to 2009-10. This indicates that many people utilize Minnesota's community and technical colleges not necessarily to earn a degree, but to develop their careers and enhance their skills.

Analyzing wage and employment outcomes for non-graduates is challenging because it is difficult to know from the data why they entered the program. It is unclear how many of those who declared a major intended to complete a degree. Wage outcomes demonstrate that many of those who did not complete a degree in fact had better wage outcomes than those who did. One explanation is that they were already employed in the field and were in school only to enhance or refresh their skills in their existing occupations. In other fields, however, graduates did see a significant wage premium over non-graduates within the same cohort. [1](#)

¹The Wage Record Interchange System (WRIS) facilitates the exchange of wage data among participating states for the purpose of assessing and reporting on state and local employment. Twenty-two states are participating in WRIS2.

A Look at Occupational Data

Two sets of data are helping DEED to keep tabs on how employment is shifting by occupation in Minnesota.

DEED has tracked Minnesota employment changes across industries during and after the Great Recession in a relatively straightforward way, using either Current Employment Statistics (CES) or the Quarterly Census of Employment and Wages (QCEW).¹

As shown in Figure 1, all but one of the state's 11 major industrial sectors lost jobs or saw little change in employment levels between the first quarters of 2008 and 2010. Education and health services was the only sector to show healthy job growth during that period.

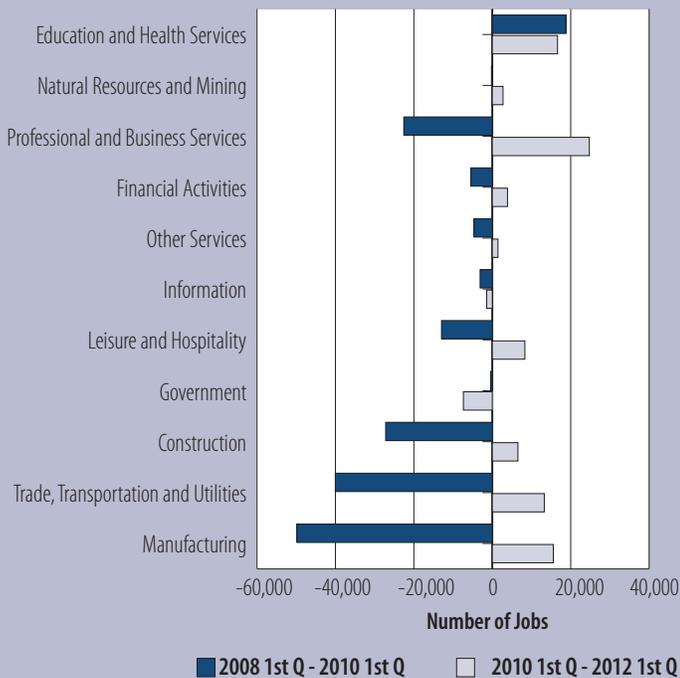
In the two years that followed, however, all sectors except information and government added jobs. Minnesota lost 147,600 jobs during the first two-year period and recovered 84,300 jobs during the second two-year period. Minnesota business have continued to add workers over the last 10 months. The net result: As of January 2013, the state had regained 90 percent of the jobs that were lost in the recession.² Some sectors have regained more jobs than were lost during the recession. Other sectors, like construction and manufacturing, remain far below pre-recession levels.

Measuring jobs lost by specific occupation in the recession is not as easy, however.

It is much easier and less costly to get companies, nonprofits and government agencies to accurately report monthly or quarterly total job numbers by industry than to get them to regularly report job numbers by specific occupations. For that reason, Occupational Employment Statistics (OES) — the only occupational employment series published

FIGURE 1

Minnesota Industrial Employment Change, 2008 - 2012



Source: Quarterly Census of Employment and Wages, Minnesota Department of Employment and Economic Development

by DEED — are available on an annual basis, rather than monthly or quarterly like the other employment series. OES figures are survey-based with no benchmarking (that is, they are not revised as more accurate information becomes available).

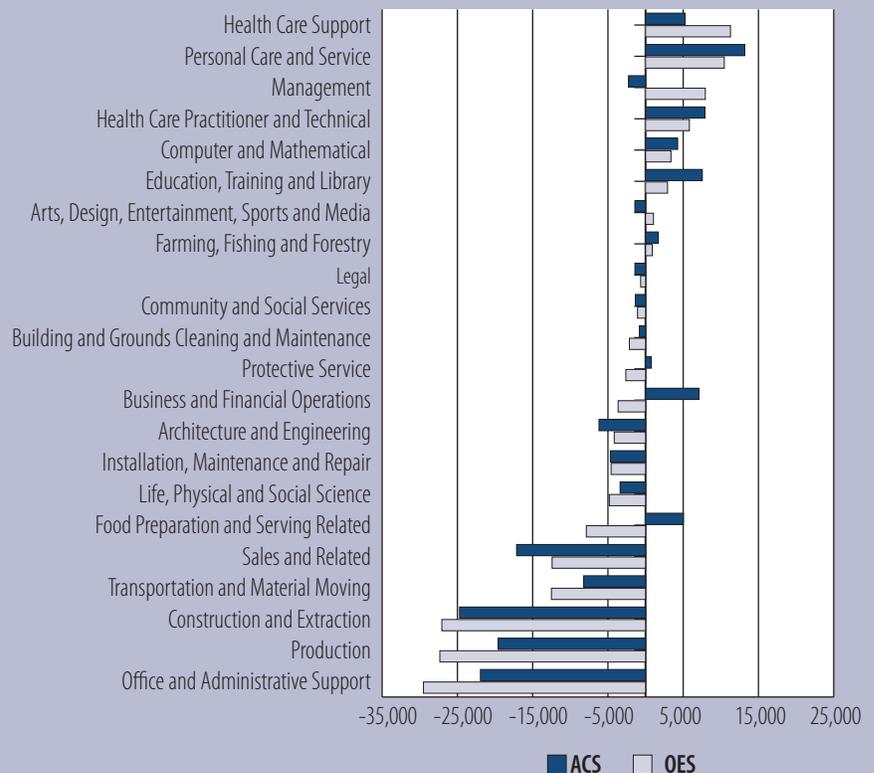
DEED conducts two OES surveys each year, one in May and the other in November. Employment and wage and salary data for about 800 occupations are collected from roughly 2,600 establishments, or about 1.6 percent of all establishments in the state.

In order to improve the reliability of the data, the six most recent surveys are pooled together. While roughly 10 percent of all establishments are included in the three years of data used for the survey, nearly 50 percent of all payroll employment is covered. The higher employment coverage is achieved by sampling every business with more than 250 employees during the three-year cycle and all state and federal government agencies once a year.

Despite the limitations of the OES survey, it provides useful information on occupational shifts in Minnesota, especially when used in combination with the American Community Survey (ACS).³ ACS data,

FIGURE 2

Minnesota Industrial Employment Change, 2006 - 2011*



* Average of 2006-2008 and 2009-2011 are compared as there is too much variation year to year.

Source: Occupational Employment Statistics, Minnesota Department of Employment and Economic Development and American Community Survey, U.S. Census

available since 2002, are obtained through household surveys that capture both self-employed jobs and wage and salary jobs. OES occupational data does not include self-employed data.

Figure 2 compares the changes in occupational employment between 2006 and 2011 after subtracting self-employed

occupational estimates from ACS data to make the two datasets more consistent.⁴ Self-employment accounts for about 7 percent of total ACS employment, with 60 percent of self-employment concentrated in four occupational groups: management, personal care and services, sales and related, and construction.

The occupational shifts appear to match up pretty well with the sharp shifts in industry employment over the last few years. Construction and production occupations suffered steep declines because of payroll reductions in the construction and manufacturing sectors.

Personal care and service, health care support, and health care practitioners and technical positions, on the other hand, increased hiring in most industries. The deep drop in office and administrative support occupations might be a surprise, but not if one considers those occupations exist in nearly every industry.

CES and ACS data showed contradicting shifts in only five of the 22 groups. The survey-based nature of the data introduces error into the estimates, and both datasets come complete with margin of errors and confidence intervals. To minimize the statistical errors, estimates from each survey were averaged over three years.

The statistical survey errors, however, are not enough to explain large discrepancies in a number of occupational groups. Half of the ACS and OES 2011 occupational group estimates differ by more than 10 percent. For example, ACS estimates that 150,000 Minnesotans worked in food preparation and serving jobs in 2011, while OES estimates 217,000 jobs in that sector.

More research is needed to understand the inconsistencies between the two occupational survey estimates. Clearing up the inconsistencies will improve our understanding of Minnesota's job picture, which in turn will lead to better labor market information. **T**



¹Two other sources of employment data are Local Area Unemployment Statistics and Occupational Employment Statistics. For a detailed comparison of the four employment data sources, see www.PositivelyMinnesota.com/assets/lmi/glossary.shtml.

²More recent data on the employment levels are available through the Current Employment Statistics program. Quarterly Census of Employment and Wage data are used here to more closely match occupational employment data.

³The American Community Survey (ACS), produced by the U.S. Census Bureau annually, surveys about 70,000 households in Minnesota, or roughly 3 percent.

⁴In addition to reporting occupational employment across the 22 major Standard Occupation Classification (SOC) groups, ACS estimates are also reported by five class of workers: employee of private company worker, government worker, private nonprofit worker, self-employed in own incorporated business worker, and self-employed in own not incorporated business workers. Self-employed in own not incorporated business estimates were subtracted from total ACS employment.

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