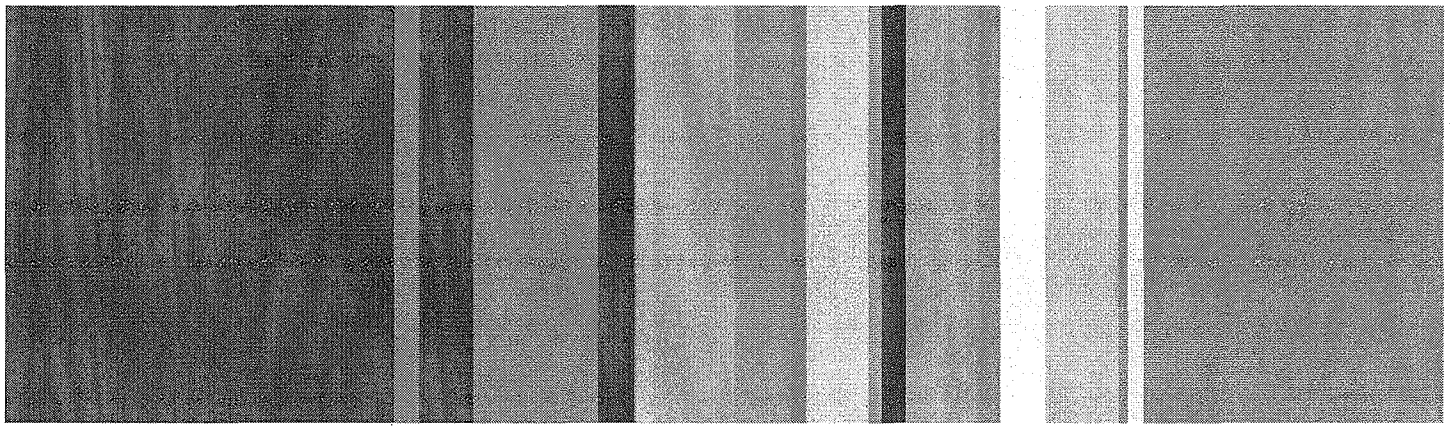
Minnesota Office of Higher Education

08 - 0236

February 2008



Financial Aid Incentives for Workforce Development (Preliminary Report)

Authors

John Smaby
Research Analyst
Tel: 651-259-3977
john.smaby@state.mn.us

Tricia Grimes
Policy Analyst
Tel: 651-259-3964
tricia.grimes@state.mn.us

About the Minnesota Office of Higher Education

The Minnesota Office of Higher Education is a cabinet-level state agency providing students with financial aid programs and information to help them gain access to postsecondary education. The agency serves as the state's clearinghouse for data, research and analysis on postsecondary enrollment, financial aid, finance and trends.

The Minnesota State Grant Program, which is administered by the agency, is a need-based tuition assistance program for Minnesota students. The agency oversees tuition reciprocity programs, a student loan program, Minnesota's 529 College Savings Program, licensing and an early awareness outreach initiative for youth. Through collaboration with systems and institutions, the agency assists in the development of the state's education technology infrastructure and shared library resources.

Minnesota Office of Higher Education

1450 Energy Park Drive, Suite 350
St. Paul, MN 55108-5227

Tel: 651.642.0567 or 800.657.3866
TTY Relay: 800.627.3529
Fax: 651.642.0675

E-mail: info@ohe.state.mn.us

www.getreadyforcollege.org
www.ohe.state.mn.us

MINNESOTA OFFICE OF HIGHER EDUCATION
reach higher

Table of Contents

Executive Summary

The need for an educated and trained workforce has long been recognized as necessary for a healthy and productive economy. Given the broad range of skills, occupations and professions required to support the modern industrial and information economies, federal and state governments monitor the makeup of the workforce and, if necessary, implement policies and programs designed to shape its composition. In recent years there has been increased interest in the use of higher education financial aid as an incentive for students to pursue specific careers.

In the general economy, wages rise with a shortage of workers in a particular occupation and fall with an over supply. In some cases, however, federal and state governments have created programs to react to real and perceived market deficiencies. These programs include tax deductions to employers to create certain kinds of jobs, grants to schools to develop training programs, and financial aid to attract students to particular careers.

In response to questions about these types of approaches to financial aid and workforce development, the Minnesota Legislature directed the Office of Higher Education to study this issue in *Laws of Minnesota, 2007, Chapter 144, Article 1, Sec. 9*:

> *Subd. 2.* ***Workforce needs.*** *The Minnesota Office of Higher Education must examine existing financial aid programs that provide loans and grants to students, and the needs of the workforce for occupations that are currently in demand or are projected to be in demand in the future and:*
> *(1) evaluate how effective the financial aid programs are in linking the needs of the workforce with the student's financial aid needs;*
> *(2) identify financial aid program options, including loan forgiveness and loan repayment programs, that provide incentives to students to pursue degrees in occupations:*
> *(i) with identified unmet workforce needs like speech pathologists; and*
> *(ii) of social or economic importance to the state; and*
> *(3) identify mechanisms, such as additional resources, to promote the growth of occupations of social or economic importance to the state. By February 15, 2008, the office must report its preliminary findings to the legislative committees with primary jurisdiction over higher education policy and finance and workforce development, and provide options and recommendations on ways to enhance the delivery of financial aid to meet the needs of both students and the state's workforce, with the final report submitted by October 1, 2008.*

Over the years, federal and state governments have tied financial aid to specific workforce development goals in several different ways. The specific conditions and details vary depending on the program and how the dollars are awarded. There are three primary approaches:

1. Public dollars are given to private employers to use for training their workers for specific occupations and skills. Various employer tax benefits or tax exemptions for training workers are a variation on this approach.

2. Federal or state grants are given to higher education institutions to develop specific education and training programs. Examples of this include a specific state appropriation to increase the capacity of nursing programs in the state, or state assistance or grants to provide customized training to one or more employers in an industry.

3. Financial aid is given directly to students as an incentive to pursue a specified field or to work in a designated location or for a particular employer. Certain tax benefits or exemptions may be used as incentives in place of, or in addition to, loans and grants.

This report limits analysis to the third type listed above, which is financial aid given directly to students contingent upon their pursuit of a specified career, employment in a particular field or work for a particular employer. Several conclusions are suggested from a survey of current literature on this topic.

- Over the years, both federal and state governments have established financial aid programs designed to encourage students to pursue specific careers.

- This type of financial aid is growing increasingly popular among policymakers. There are examples of long-standing, well-sustained programs, and programs with less conclusive results.

- Work-contingent financial aid programs are sometimes established as ad hoc solutions to real or perceived labor shortages, without consideration of their place in the larger context of state financial aid, education, economic and workforce policy.

- There are important administrative considerations for development of financial aid programs that are contingent on students entering into particular employment. Such programs must take into account consequences and implementation for students who decide not to work in the designated area after receiving the aid. Such programs must consider options for changing workforce conditions. Long-term programs to address short-term shortages can cause imbalances that could make the employment requirement impractical or impossible for some students.

Background

There are two general types of financial aid incentives used to encourage students to enter a certain field of study or career. The first is grants or loans offered to students while they are in school. The second is aid, often in the form of loan forgiveness, which is given to students who enter a specific career after they graduate, or work for a particular employer or in a specific region.

In-School Incentives

In-school incentives are grants, scholarships, and fellowships paid directly to students as incentives to pursue a particular major, discipline or career while in school. The financial aid goes to the student prior to entering the workforce. With this "no strings attached" model there is no promise or requirement that the student enter a certain field. In this case, while the grant may have achieved the desired goal of increasing the number of students in a particular major, it may not have contributed to workforce development.

Given the risk involved for the funding agency with the pre-pay incentives, some organizations have adopted a "service-payback" approach. In these programs, the student receives the financial aid while in school and agrees to work a fixed number of years in a particular job or geographic region. There may be a number of different requirements attached to the financial aid, but many programs now require that the student pay back the financial aid if the student does not fulfill the workforce conditions of the financial support.

Questions have been raised about whether the grants attract students who otherwise would not have chosen the particular field. No conclusive evidence was found to answer these questions in a global way.

Post-School Incentives

Post-school incentives are designed to recruit workers for a particular occupation, employer, government agency, or geographic region from the existing workforce. Incentives are paid to students after their education is complete and they have entered the workforce. Incentives commonly take the form of loan repayment or loan forgiveness.

Loan repayment programs increase disposable income for the student by an amount equal to the payment. In this case, the cost of paying the loan is shifted from the student to the entity ultimately making the payment. This may be either the taxpayer or a private employer. In some cases private employers may lobby for a "loan forgiveness" program where the burden of paying for the loan is borne by the taxpayer.[1]

[1] Under certain conditions loan amounts "forgiven" by the lender or paid by the employer are taxable as part of the student's income.

Federal Programs Linking Financial Aid and Workforce Development

The federal government has adopted a number of programs to influence workforce development in the country. This report will not summarize all of the federal programs. Rather, it identifies several relevant programs and cites the results of studies that evaluate these approaches.

- One approach is the well-known military model. For many years the military has used the service-payback model with positive results to recruit and train officers using their service academies and college ROTC programs. Students have some or all of their educational expenses paid in return for a fixed number of years of service. In other military recruiting programs, educational benefits are paid to the student after they perform the required service. Recent changes in National Guard tuition programs is an example.

- The new Federal SMART grant, which provides Pell-eligible students in their third and fourth years of college who major in science, technology, mathematics or engineering, with a $4,000 annual grant is an example of an in-school incentive.[2] This program targets students who have a baseline financial need, and provides a generous incentive for them to enter particular programs. It was first offered to students in the 2006-2007 academic year when 1,059 students enrolled in Minnesota received grants.

- Another older approach addressed a perceived shortcoming in certain scientific-centered occupations. In 2004 the RAND Corporation issued a report examining the United States' need for science, technology, engineering and math (STEM) professionals and the efforts of the federal government to train and recruit adequate numbers of workers in these disciplines (Butz et al., 2004). It looked at the entire range of federal efforts including the service academies, the GI Bill, the National Defense Education Act, and agency-specific programs. Workforce-shaping mechanisms such as loan forgiveness and repayment in the Center for Disease Control, NASA, the National Science Foundation, the National Institute of Health, Department of Defense and Homeland Security are being used successfully to recruit and retain employees in strategic areas. Cross-agency efforts have not been common, and those that do exist have had problems. The Cyber Service or Cyber Corps Scholarship Program mentioned is an example.

  The report found that:

  > "The federal government's pipeline-filling measures have been largely successful in the aggregate. The federal government has created a mature institutional framework with well-designed implementation mechanisms refined by decades of experience. At the aggregate level, it has had a fair amount of success in addressing STEM worker supply issues, including those affecting minorities and women." (Butz et al., 2004)
  >
  > "The basic assistance mechanisms include grants, scholarships, fellowships, assistantships, loans and work-study programs. Trends in federal higher education funding suggest that loans to individuals and block grants to states are becoming the most frequently used mechanisms." (Butz et al., 2004)

[2] Information on the federal SMART Grant is available from the Office of Higher Education at www.getreadyforcollege.org/smart.

"Given that most of today's STEM students graduate from college with substantial amounts of loan debt, some form of loan forgiveness or repayment would likely serve as an effective recruiting mechanism for a substantial portion of STEM graduates. The current federal program for loan repayment is available to federal employees, but is not STEM-specific." (Butz et al., 2004)

- The Rand report considered the National Defense Education Act of 1958 the most comprehensive and best example of federal efforts to shape the workforce. This Sputnik-inspired bill distributed $4 billion over four years to all segments of the educational system. It included funds for improving K-12 science and mathematics teaching, funds for undergraduate loan forgiveness for science teachers, and graduate fellowships for students pursuing university level science and mathematics teaching and research careers. Most of these initiatives have been expanded and incorporated into a number of other federal programs. The Rand report also found that:

  "There has been little systematic evaluation of the NDEA's success in strengthening the U.S. education system or its broader impact on the competitiveness of the country as a whole." (Butz et al., 2004)

  "The loan program was widely used by undergraduates. There is no convincing evidence, however, that loan forgiveness provisions induced these borrowers to become teachers." (Butz et al., 2004)

  "Funding for foreign language institutes was also successful and has continued through subsequent programs." (Butz et al., 2004)

  "Overall, the NDEA has been judged to be an extraordinarily successful legislative initiative. One measure of its success is the swiftness with which its impact was felt....In less than a single decade, American science education underwent a complete reformulation." (Butz et al., 2004)

- Another federal incentives program is the Federal Teacher Loan Forgiveness Program. The Federal government will "forgive" up to $5,000 a year of Federal Teacher Loans and Stafford Direct Loans if the student has been employed as a full-time teacher for five consecutive complete academic years in an elementary or secondary school that has been designated as a "low-income" school by the U.S. Department of Education. Teachers working at any school in "high demand" subject areas such as science, math and special education can qualify for up to $17,500 of loan forgiveness.

- The Federal Cyber Corps program is an example of a federal financial aid program in which the job market shifted for students and graduates, thus undermining the program.

  The program was established in 2001 to provide information security professionals for the federal government. It provided funding to a number of universities to upgrade their information security programs. It also provided 200 full "scholarships" for students using the service-payback model requiring a summer internship and two years of service after graduation. However, there have been disadvantages to the program:

"Federal agencies have been resistant to hiring Cyber Corps graduates because of tight budgets, confusing guidelines, concerns about limited retention, and the cost and time required to obtain mandatory security clearances. That, in turn, has left many students discouraged. 'Some are understandably bitter,' says Eugene Spafford, director of Purdue University's Center for Education and Research in Information Assurance and Security." (McLellan, 2003)

The Federal Cyber Corps program highlights the need for careful occupation specific labor market research to confirm the demand for workers prior to establishing a service-payback program.

Minnesota Programs Linking Financial Aid and Workforce Development

In general, Minnesota has chosen not to link financial aid to workforce development but instead allow students to make education and career choices guided by personal interests and labor market conditions. Minnesota's financial aid workforce incentive programs are concentrated in the Department of Health and fund healthcare-related occupations and professions.

The following is a list of these programs:

- Allied Health Care Tech Faculty Loan Forgiveness
- Dentist Loan Forgiveness
- Nurse Faculty Loan Forgiveness
- Nurse Loan Forgiveness
- Rural Midlevel Practitioner Loan Forgiveness
- Rural Pharmacist Loan Forgiveness
- State Loan Repayment
- Urban Physician Loan Forgiveness

Program Effectiveness

The Department of Health Loan Forgiveness Programs were evaluated by an outside evaluator and the results published in a report, *Bringing Health Care to the Heartland: An Evaluation of Minnesota's Loan Forgiveness Programs for Select Health Care Occupations*, April 2007. The evaluation found that:

> "To date this and subsequent Loan Forgiveness Programs have supported 564 physicians, nurses, nurse practitioners, nurse-midwives, physician assistants, clinical nurse specialists, pharmacists, dentists, and allied health or nursing faculty. They...begin their practice in rural Minnesota or another high-need location such as nursing homes, intermediate care facilities for the mentally retarded, or dental practices serving more than 25 percent low-income or public-program patients."
>
> "After almost seventeen years of operation and growing from an annual state appropriation of $320,000 to $1.295 million in 2007, the Minnesota Loan Forgiveness Programs have also served over 300 health care facilities and educational institutions from throughout the state. In the past seven years, Minnesota has invested a total of $7.789 million in the Loan Forgiveness Programs"
>
> "The Loan Forgiveness Programs were effective in getting health care practitioners into high need locations."
>
> "A majority of health care practitioners who complete their service obligation remain in similar practice settings in Minnesota to continue their practice."
>
> "The Loan Forgiveness Programs examined in this report and administered by the Minnesota Department of Health are successfully meeting their program goals and increasing the number of health care providers and educators in rural Minnesota and specialty locations." (Bringing Healthcare to the Heartland, 2007)

Other Programs Linking Financial Aid and Workforce Development

Other states have adopted programs with the policy goal of influencing occupational choices. There are two major studies that evaluated these programs generally.

In 2004 the Lumina Foundation issued a comprehensive report summarizing state workforce-contingent financial aid programs that assist individuals with their education expenses in exchange for work in either specified fields or specified locations (Kirshstein et al., 2004). The report found that:

> "In 2001–2002, 43 states supported programs that either (1) provided financial aid to students while they were enrolled in school in exchange for a future workforce commitment or (2) repaid an existing educational debt in exchange for specified work."
>
> "Based on the 100 programs that provided data, over 26,000 individuals received support from in-school or workforce-contingent programs in the 2001–2002 academic year. Teaching, nursing, and medicine were the most frequently supported occupations."
>
> "In-School programs accounted for about 75 percent of all programs and supported approximately 90 percent of all identified participants. However, between 1998 and 2002, On-the-Job programs appeared to be increasing in number at a faster rate than in-school programs. Beyond the work requirement imbedded in both in-school and workforce-contingent programs, other aspects of these programs tended to vary widely."
>
> "Although this study did not intend to determine the effectiveness of workforce-contingent programs, it did ask states about evaluations they had conducted. Very few studies emerged that evaluated either the financial aid or the workforce aspects of these programs. Further, the report concluded that very few studies exist at the national level."
>
> The study concluded that: "These programs may very well be effective in addressing the escalating price of college and or workforce shortages. However, the growth of both in-school and workforce-contingent programs cannot be attributed to research supporting these assumptions. Given the growing popularity of these programs, strong evaluations of both types of programs are needed to answer questions of effectiveness." (Kirshstein et al., 2004)

In 2002 The Institute for Higher Education Policy issued a report, *Accounting for State Student Aid: How State Policy and Student Aid Connect*, by Jane Wellman. State policies and accountability strategies for student aid are examined in this report for 11 states: California, Florida, Illinois, Minnesota, New Jersey, New York, Ohio, Texas, Pennsylvania, Vermont and Virginia. These states were selected because they were making some of the largest investments in state-funded aid, and because they represent a cross-section of approaches to the governance and administration of student aid. The study found that there was often a disconnect between state economic and education policies, and state financial aid policy: namely, that financial aid policy was not developed in the context of overall state policy. Financial aid linked to workforce development was singled out for particular criticism. The report found:

> "In many states, new programs are added on an ad hoc basis, as student aid is a favorite target for special interest legislation designed to fund niche purposes, such as getting more students into high-demand occupations like teaching and nursing. These small aid programs end up having a political half-life that allows them to survive despite weak or nonexistent evidence of their effectiveness." (J. Wellman, 2002)
>
> "At the same time, most states are under-funding their own goals for need-based grant programs, which are suffering for funding despite recent heavy increases in tuitions."
> (J. Wellman, 2002)

The report concludes by recommending that states "Avoid special purpose programs."
(J. Wellman, 2002)

Other Questions to be Considered

Identified Workforce Needs

In its directive to the Office of Higher Education, the Legislature asked the agency to identify "unmet workforce needs like speech pathologists and (occupations) of social and economic importance to the state." To do this, the Office of Higher Education relied on research performed by the U.S. Bureau of Labor Statistics to identify which occupations will be in high demand between the years 2004 and 2014. The Bureau of Labor Statistics, together with the Department of Employment and Economic Development, provide estimates of nearly 800 occupations over this time period for the state. These agencies combined this demand data with educational requirements for these occupations. Data were combined with estimates of degrees granted in order to develop a measure of percent of need met. The table below contains information on eight occupations for which degree production is not effectively keeping up with projected job demand.

High-Demand Occupations for Which Degree Production May not be Keeping Up with Employer Demand in Minnesota

Job Title	Projected New Workers Needed by 2014	Percent of Need Met in First 3 yrs. of 10-year Projection	Minimum Education Requirement	Area of Study
Business Operations Specialists, All Other	19,444	1.2%	Master's Degree	Business
Claims Adjusters, Examiners, and Investigators	1,373	15.1%	Bachelor's Degree	Business
Urban and Regional Planners	407	15.5%	Master's Degree	Business
Securities, Commodities, and Financial Services	2,035	17.7%	Master's Degree	Business
Human Resources Assistants, Except Payroll	1,240	18.4%	< 2-year Certificate	Business
Educational, Vocational, and School Counselors	1,860	10.0%	Master's Degree	Social Science
Preschool Teachers, Except Special Education	1,972	10.2%	Bachelor's Degree	Social Science
Community and Social Service Specialists, Other	2,415	16.5%	Bachelor's Degree	Social Science

Sources: Minnesota Department of Employment and Economic Development (job data), Integrated Postsecondary Education Data System (degree completion data)

The table below shows examples of occupations for which degree production appears to have generally kept pace with workforce projections by the Minnesota Department of Employment and Economic Development. Projected need in these areas and credential production are as follows:

Job Title	Number Needed by 2014	Percent of Need Met in First 3 years of 10-year Projection	Minimum Education Requirement
Medical Records and Health Information Technicians	1,700	71.1%	Associate's Degree
Registered Nurses	24,042	35.5%	Associate's Degree
Licensed Practical and Licensed Vocational Nurses	6,387	51.8%	< 2-year Certificate
Speech-Language Pathologists	764	35.7%	Master's Degree

Sources: Minnesota Department of Employment and Economic Development (job data), Integrated Postsecondary Education Data System (degree completion data)

These figures are estimates and the figures only represent one of several potential sources (program graduates) for filling job demand. Some may enter these fields without degrees specific to the job. Some employers may offer an on the job training option to move existing employees up the ladder to fill some of these openings. Additional research could be performed with these projections to analyze specific regions or occupations within fields that may have worker deficits. This work could be undertaken in conjunction with the Department of Employment and Economic Development and the institutions of higher education in the state.

Speech Pathology

In the legislative discussions leading to the directive for this report, there was particular emphasis on the field of speech pathology. Members expressed concern about a shortage of speech-language pathologists in public schools, and inquired about the possibility of using a financial aid incentive to attract students to these positions.

The U.S. Department of Labor Statistics reports the following data on Speech-Language Pathologists as of August 2004:

> About half work in educational services, and most others were employed by health care and social assistance facilities.
>
> A master's degree in speech-language pathology is the standard credential required for licensing in most states.
>
> Employment is expected to grow because the expanding population in older age groups is prone to medical conditions that result in speech, language, and swallowing problems.
>
> Employment of speech-language pathologists is expected to grow about as fast as the average for all occupations through the year 2014.
>
> In 2004, 239 colleges and universities across the nation offered graduate programs in speech-language pathology that are accredited by the Council on Academic Accreditation in Audiology and Speech-Language Pathology.

The Association of Speech-Language and Hearing Pathologists' Web site contains detailed information on the job market and recruiting strategies in the field. It points out shortages in some "at-risk" urban schools and rural areas, and lists barriers discussed below to recruitment and retention in the public schools.

> "Both ASHA's 2004 Schools Survey (ASHA, 2005) and the study of Ohio schools (Legislative Office of Education Oversight, 1999) identified the most important considerations for speech Language Pathologists seeking employment. These included salary, working conditions, advancement opportunities, and professional development opportunities." (ASHA Web site 2007, www.asha.org/default.htm)
>
> "Low Salaries: Thirty-eight percent of school-based speech language pathologists report low salaries as one of their greatest challenges. ASHA's 2001 Omnibus Survey (J. Janota, personal communication, October 15, 2001) compared salaries for school-based speech language pathologists with salaries for speech language pathologists working in other settings. The median

calendar-year salary for school-based speech language pathologists with one to three years of experience was $33,000; for speech language pathologists in other settings it was $40,000. In the seven to 12 years of experience range, school-based speech language pathologists earn an average of $40,378 compared with $47,000 in other settings.. For professionals with 13 to 21 years of experience, speech language pathologists in other settings earn on average $3,860 more than school-based speech language pathologists. The effect over the years of the deficit in salary for school-based speech language pathologists may be a major factor in problems related to their successful recruitment and retention." (ASHA Web site 2007, www.asha.org/default.htm)

School-based speech language pathologists typically work a nine-month contract, while those in other settings work year-round, which may contribute, in part, to the wage disparity at all levels of experience.

Information on employment and wages is presented in the table below. The state of Minnesota's Web site www.MinnesotaCareers.org Web site reports the following data for speech pathologists and audiologists:

Minnesota Speech Pathologists & Audiologists

Employment	2,690
Hourly Wage-Low-End	$18.10
Hourly Wage-Median	$25.20
Hourly Wage-High-End	$33.80
Occupational Growth	5.8%
Avg. Growth-All Occupations	12.8%
Job Outlook:	Good

Source: MinnesotaCareers.org

Recommendations for Policy Consideration

As Minnesota considers ways to provide students with opportunities that lead to rewarding, high-demand careers, it is important to consider options carefully. The Office of Higher Education is prepared to explore the feasibility of new financial aid programs. Proposed programs should be developed in the context of and consistent with state education, financial aid, economic and workforce development policies.

The background and literature suggest a number of policy considerations important to developing new incentive or financial aid programs. These are:

1. Before developing a program, systematically contact employers to determine the extent of the alleged labor shortage? Often, predicted labor shortages based on incomplete or anecdotal evidence turn out to be wrong. Given the difficulty of accurately predicting workforce shortages, close coordination with potential employers is critical for the success of any workforce-contingent incentive program (Veneri, 1999).

2. Consider all the reasons for a labor shortage in a particular field. Why are students not attracted to the target career or discipline? The problem may be insufficient pay, undesirable working conditions, or lack of career advancement. In these cases, grants or scholarships may not be effective. These issues may cause students to change their minds upon graduation.

3. Consider how the program will be marketed. Who is the target market for the program? What group of students or potential students is the program designed to attract? Some programs fail due to insufficient or ineffective marketing.

4. Be certain that the incentives (and penalties for non-compliance) are sufficient to attract and retain students or employees. Given the widespread availability of student loans, will the promise of a loan, without loan forgiveness or repayment, be enough to attract students?

5. Funding should be sufficient to cover eligible participants to ensure program integrity. For example, last year the Department of Health was able to fund loan repayments for only seven pharmacists, even though many more students had qualified and applied. When few people receive the benefit, students may not respond to the program's incentives.

6. Consider whether postsecondary institutions will produce graduates with the training and skills that the employers want and are willing to hire? Not only must the funding agency work closely with potential employers, but educational institutions must also work closely with employers to insure that their program graduates will meet the needs of the employers.

7. Consider how long the program will be needed. Long-term programs created to address very immediate shortages can lead to uneven expectations as market conditions shift.

References

Arnone, M., Hebel, S., & Schmidt, P. (2003, January 3). Another Bleak Budget Year. *The Chronicle of Higher Education*, A21.

Association of American Medical Colleges (AAMC). (2002). *Medical School Graduation Questionaire: All-school report.* Available at www.aamc.org (December 30, 2003).

Basinger, J. (2003, June 13). House panel approves stricter rules for teacher-training programs.

Bringing Health Care to the Heartland: An Evaluation of Minnesota's Loan Forgiveness Programs for Select Health Care Occupations. (2007) Minnesota Department of Health, Office of Rural Health and Primary Care.

Butz, W. Kelly, R. Adamson, D. Bloom, G. Fossum, D. Gross, M (2004) *Will the Scientific and Technology Workforce Meet the Requirements of the Federal Government?* RAND Corporation.

The Chronicle of Higher Education, A25. Burd, S. (1993, October 13). New life for National Health Service Corps.

The Chronicle of Higher Education. Available to members: www.chronicle.com (September 2, 2002).

Castro, Y. (2002, July 2). Dentist Who Choose to Work in Rural California Get Help with Loans. *The Fresno Bee.*

Journal of the American Medical Association, 281(3). Available at jama.ama assn.org/issues/v281n3/ abs/joc80057.html (November 15, 2002).

Kirshstein, RJ, Berger, A.R, Benatar, E., Rhodes, D., (2004) *Workforce Contingent Financial Aid: How States Link Financial Aid to Employment,* Lumina Research Report.

McLellan, V. (June 2003) *Cyber Corps Failing Grades,* Tech Target.

McMillion, R. (2002). Focusing Priorities. *ABA Journal, 88*(5), 60–61.

National Association of State Student Grant and Aid Programs (NASSGAP). (2002). *32nd annual survey report on state-sponsored student financial aid.* Albany, NY: Author.

Pathman, D.E. et al. (2000). State scholarship, loan forgiveness, and related programs. *The Journal of the American Medical Association, 284*(16), 2084–2092.

Rabinowitz, H.K., Diamond, J.J., Markham, F.W., & Hazelwood, C.E. (1999). A Program to Increase the Number of Family Physicians in Rural Underserved Areas: Impact After 22 Years.

Recruiting New Teachers, Inc (RNT) (2000). *A guide to today's teacher recruitment challenges.* Belmont, M.A.

Selingo, J. (2002, April 19). States with biggest deficits take aim at higher education. *The Chronicle of Higher Education*, A24.

Shoichet, C.E. (2002a, August 2). Nurses Needed Stat: Shortage Leads Colleges to Expand Programs and Recruitment. *The Chronicle of Higher Education*, A30.

Shoichet, C.E. (2002b, August 6). Bush signs law to expand access to nursing education. *The Chronicle of Higher Education*. Available to members: www.chronicle.com (September 2, 2002).

Spero, I. K. (1986). The Use of Student Financial Aid to Attract Prospective Teachers: A Survey of State Efforts. Washington, DC: The College Entrance Examination Board.

State University of New York- Buffalo (SUNY-Buffalo). (1994). BRIEF: Freshman intended major to undergraduate degree major. Available at www.provost.buffalo.edu/OIA/publications/briefs/NTMAJ.html (Dec. 18, 2002).

Toch, T. (1983, July 27). The Right Sort: Improved Teaching is the Goal of Varied Initiatives. *Education Week*. Available at www.educationweek.org.

Teague, K. (2003). *RetroWeb classic television: Northern Exposure*. Available at www.retroweb.com/nexp.html (July 14, 2003).

U.S. Department of Education. (2002). *No Child Left Behind: A desktop reference,* Washington, DC: Office of Elementary and Secondary Education.

Veneri, C.M. (March 1999) Can Occupational Labor Shortages be Identified Using Available *Data?, Monthly Labor Review.*

Viadero, D. (2002, April 10). Researcher Skewers Explanations Behind Teacher Shortage. *Education Week, 21*(20), 7.

Wellman, J. (2002). Accounting for State Student Aid: How State Policy and Student Aid Connect. Washington, DC: Institute for Higher Education Policy.