

Vocational Education for Non-College-Bound Youths

A Report Prepared for Women at Work

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I. Introduction

The US educational system was put under close public scrutiny with a 1984 report by the National Commission of Excellence in Education (NCEE) titled *A Nation at Risk*. The report warned that American Youth were poorly prepared, and stressed the need to focus on the “New Basics” of mathematics, reading, and writing. The rising payoff to college in the 1980s also led to a college-prep based high school curriculum. Between 1982 and 1992, the number of vocational credits (courses in trades, construction, business, etc) taken by high school students fell 21%. While this curriculum shift will pay off for college-bound students, they represent only half of 19 to 20 year olds. The other half will seek full-time work within a year of leaving high school.

Non-college bound youths can quickly find themselves stuck in low-skill, low-wage jobs with no room for advancement. Vocational programs provide these youths with the necessary skills to pursue meaningful, high-wage careers. While the NCEE’s report offers a foundation for the theory that rewards for academic skills have increased more than the rewards for occupation-specific skills, there is little empirical evidence to support it. Bishop (1995) found that occupation-specific training at the shop-floor level increases your likelihood of getting a job in that field, your productivity, and the likelihood of receiving further training. This report will examine how vocational education and school-to-work programs may improve the labor market experiences of non-college bound youths, with a particular focus on women.

This paper is divided into four sections. The first section will apply economic theory to vocational training. This section will outline the human capital model and its application to the lives of non-college bound youths, as well as providing a theoretical framework for the costs and benefits of vocational education. The second section discusses the empirical literature on the employment and earnings effects of school-to-work and vocational programs, developing empirical support for the cost and benefits theory. The demand for non-traditional occupations will be discussed in the third section using statistics from the Department of Labor. Wages, working conditions, and other job characteristics will be reported in addition to identifying the occupations where demand is the strongest. Finally, this report will provide a general overview of government-funded and non-profit vocational programs in the United States. This section will include specific information on the WINTER (Women in Non-Traditional Employment Roles) program and its Rosie the Riveter Charter High School.

II. The Economics of Vocational Training

Economists refer to an individual’s unique set of abilities and acquired skills as human capital. There are various ways to acquire human capital such as through education, vocational training, on-the-job training, night school, for formal training programs. The human capital model describes the costs and benefits of investing in one’s knowledge. Investing in human capital creates up-front costs, and the benefits of the investment are seen in the future. There are different costs when investing in human capital. First, there are direct expenses, which are incurred through spending on tuition,

books, and supplies when obtaining an education. Second, there are opportunity costs of lost wages since it is highly unlikely that a person will work while in school. The last cost is a psychological loss because learning can be difficult for some people. These costs are incurred by workers choosing to invest in their own capital.

Benefits of investment in human capital can be seen in the long-run. Education and training increase a person's productivity and efficiency, so wages and earnings will be higher in the future. To determine if the benefits outweigh the costs of investment, the present value of investing in one's human capital and not investing must be examined¹. If the present value of investment is greater than the present value of not investing, then a worker should invest in his or her education. If the opposite is true, then the cost of investing in one's human capital would be greater than the benefit in the future, so the worker should not invest.

Vocational training/education is one type of investment in human capital. Theoretically, high-school students enrolled in vocational education should benefit from the program. In a public school system, it is likely that vocational training is provided free to students, just the same as academic classes. Therefore, the benefit the student receives in the future should outweigh the (non-existing) cost, unless the psychological cost to the student during the training is greater than the payoff. There are also costs of vocational training. Finding and paying teachers to teach in the program, as well as supplies for the program, would be costs paid by the school or organization running the program.

For non-college bound students, we would expect enrollment in vocational training and academic courses to have a greater future payoff than simply enrolling in academic courses. We would anticipate significant payoff with the vocational training because the training would increase the students' human capital knowledge more than just academic classes. In "The Relation Between Vocational Training in High School and Economic Outcomes" (1982), authors Gustman and Steinmeier find similar deductions, but with gender differences in the economic return to the training. They actually found that men had negligible benefits from vocational training (meaning they did not experience any significant increase in wages after high school) but women acquired the expected benefits of the program.

Gustman and Steinmeier are economists who have studied the issue of the benefits of vocational training and they discuss the problems with measuring these benefits in another 1982 paper titled, "Labor Markets and Evaluations of Vocational Training Programs in the Public High Schools-Toward a Framework for Analysis". They argue that although there have been empirical studies dealing with vocational studies, it is actually very difficult to measure the actual benefits. The standard method of looking at the differential between the wages of graduates of vocational programs and the wages of other high school graduates only indicate the value of the program for the marginal person. Further, such studies do not indicate the value to all vocational graduates or even all high school graduates. There are numerous factors that complicate the estimation. For

¹ The concept of present value allows us to compare dollar amounts spent and received in different periods. This is important when comparing the future benefits of human capital with the present costs of acquiring human capital.

example, the minimum wage will limit the number of openings for on-the-job training as does the labor supply in general. The authors find that vocational training and the minimum wage interact in a complicated fashion, and this interaction affects wages and employment. It is possible that vocational training may offset the negative effects of the minimum wage. Other complications include quality of the vocational training and the availability of on-the-job training.

There is ample evidence that vocational training benefits the participants. However, the benefits to those who did not participate are difficult to measure. This makes it hard to quantify the societal benefits of such programs. However, it is still clear that these vocational programs are beneficial and useful for non-college bound youths. Because they will not have a college degree to act as a signal of their productivity to employers, participating in vocational training indicates to employers that they have important skills needed for certain jobs. Therefore, it is usually beneficial for these students to enroll in vocational programs because it does increase their human capital which will translate into higher wages. This will be true as long as the costs of vocational training are small enough.

The human capital model is used to determine the benefits and costs of investing in human capital, and this model can be used when trying to determine whether vocational training is worthwhile. If the benefits from vocational training exceed the costs, then the person should participate in vocational training, especially those who are non-college bound youths because they will probably benefit from these skills in their job. The only problem is that it is hard to measure the actual benefits, as discussed by Gustman and Steinmeier.

III. Is There a Payoff to Vocational Education?

This section of the report provides a summary of the empirical literature on the impact of vocational training or “school-to-work” programs on earnings and employment. Does research show that the benefits of vocational education or school-to-work programs outweigh the costs? To what extent do the findings differ by gender? The literature on vocational training can be separated into two categories. The two categories are pre-1980 and post-1980 literature. The work before 1980 does not generally support vocational training as a means to increase wages. While work after 1980 shows significant returns to vocational training. The difference in conclusions reflects a broader change in our economy. The growth of computers and technology created a change in the skills required for most jobs. In order to compete with global labor markets, U.S. workers began to need additional training. The returns to vocational training rose as a result of the labor market’s new educational demands.

The conclusions of most pre-1980 literature are best outlined by a study that focused on vocational training in high schools (Gustman and Steinmeier 1982). The research of economists before Gustman and Steinmeier found that the returns to business and office training were significant for women. However, other vocational training for women and all vocational training for men had no such effect. The purpose of the paper

was to test the findings of previous work. Gustman and Steinmeier found that they supported previous research, but the research was nonetheless robust because it was based on primitive data. The research also lacked any consideration of the costs to vocational training, by simply focusing on the benefits. Thus perhaps the pre-1980 research was too primitive to give an accurate cost-benefit analysis of vocational training. It seems more likely that the research was accurate, and that as our economy became more global the returns to vocational training increased.

As the quality of America's workforce compared to the world workforce became a topic of debate, studies began to collect more precise data on the benefits to vocational training. The literature after 1980 reflects this greater concern for increased education. One study specifically addressed this growing concern (Veum 1995). Using data from the National Longitudinal Survey of Youth, Veum looked at who enrolls in the various types of training programs and the effectiveness of those programs. He found that the duration of training programs had little or no effect on wages, but that the incidence of the training program did have an effect on wages. More specifically Veum concluded that vocational institutions had some success in improving wages, and that success should not be ignored when decision makers consider all the methods to enhance young workers' skills.

Another more recent study found similar results (Bishop and Mane 2004). The study used a data source similar to the one used by Veum, the National Educational Longitudinal Study. Bishop and Mane found significant rates of return to vocational training programs. Moreover, they found that the high school vocational programs outperformed government programs targeting high school dropouts. Thus, the benefits of vocational training are higher for people who are still in high school.

In addition to the empirical evidence uncovered by Veum (1995), Bishop and Mane (2004), the economic research of Neumark and Rothstein (2005) specifically outlines the effects on vocational training on less-advantaged youths, who in the absence of intervention, are unlikely to go to college. These economists describe this group as the "forgotten half." While Neumark and Rothstein (2005) find that vocational training has positive effects on all young people, they find that these programs have a much more profound effect on individuals who are less likely to attend college. They study the impact of various vocational programs which are job shadowing, mentoring, cooperative education, work in a school-sponsored enterprise, tech prep and internships or apprenticeships (Neumark and Rothstein 2005). They use data from the 1997 National Longitudinal Survey of Youth to observe what effect did participation in these vocational programs have on the likelihood of post-secondary education, the level of employment and earnings and the decrease in idleness after leaving high school.

Among men in the "forgotten half," Neumark and Rothstein (2005) find that mentoring and cooperative programs increase the likelihood of these men attending post-secondary education, especially increased attendance in 2-year college programs. Moreover, they discover that cooperative programs, school enterprise and internship/apprenticeship programs enhance employment and decrease idleness upon their high school graduation. Further, Neumark and Rothstein (2005) determine that, for women, internship/apprenticeship programs lead to an increase in earnings. This evidence further supports that vocational programs greatly advance the opportunities of non-college bound youths.

The findings of Veum and other economists in recent years (Bishop and Mane 2004) support vocational training programs. It is important to note that the amount of time spent in those programs is less important than their initial use. This suggests that vocational training is used primarily as a signaling device to employers. The signal allows workers to get higher paying jobs, and therefore the increase in wages comes from the higher pay.

IV. The Demand for Non-Traditional Occupations

Non-traditional occupations are defined by the U.S. Department of Labor as jobs in which 25 percent or less of the workforce is female. Women currently employed in non-traditional occupations are experiencing higher wages, more financial security, better benefits, higher demand for their labor, opportunities for advancement and freedom to pursue careers related to interests and abilities. It has also been established that employers of non-traditional jobs are less concerned with the gender composition of their workforce than in the past as long as the workers have the necessary skills.

Traditionally male-dominated occupations were in need of highly skilled workers, thus making it difficult for young, non-college-bound women to enter. However, recent efforts such as Women in Apprenticeship and Nontraditional Occupations (WANTO) Grants put into action by the Women's Bureau and the Employment and Training Administration's (ETA's) Office of Apprenticeship Training, Employer and Labor Services, provides financial and technical support for those employers who are actively recruiting women into non-traditional occupations. Therefore, there are more opportunities emerging for women. In addition, institutions located in Southern California such as Women In Nontraditional Employment Roles, Los Angeles Trade Tech College, and LA Infrastructure Academy are providing intensive professional training for women. Thus, new opportunities are opening up for non-college-educated women to obtain higher paying, safer, and more satisfying jobs. According to the statistics of Women's Bureau, among non-traditional occupations there seems to be a high demand for women laborers in the fields of upholstery, criminal investigation, architecture, technical engineering, and security and gaming surveillance.

An upholsterer maybe one of the jobs that employers will favor to hire non-college-bound young women since most of the workers in this occupation learn through on-the-job training. Most employers in this industry are looking to hire high school graduates who are seeking jobs in the textile industry. The job of an upholsterer is to produce and repair furniture covered with fabric. The job largely consists of handling old bed mattresses. An upholsterer will remove the old covering of a mattress and replace the springs and the wooden frames of the mattress. Median hourly earnings of an upholsterer is \$12.35. This job may is physically demanding and requires workers to do a lot of bending and lifting. Even though the common job of an upholsterer is not so much dangerous, they must wear special clothing and gloves to handle sharp tools. However, this particular job pays well. One point that should be considered for perspective upholsterers, is that this industry is rapidly declining due to higher accessibility of employers for cheap foreign labor, and growth of imports.

Occupations in criminal investigation and detective work, by law are not available for non-U.S. citizen women to enter. These jobs vary from the state level (uniformed police officers) to the federal level (U.S. DEA agent). At the state level, officers will perform general law enforcement duties, including maintaining regular patrols and responding to calls for service. They may direct traffic at the scene of an accident, investigate a burglary, or give first aid to an accident victim. While at the federal level, officers are mainly responsible for investigating violations of more than 200 categories of Federal law and conducting sensitive national security investigations. Agents may conduct surveillance, monitor court-authorized wiretaps, examine business records, investigate white-collar crime, or participate in sensitive undercover assignments. Candidates for this occupation must be U.S. citizens, and must meet certain qualifications in terms of physical and personal abilities in addition to age limits. There is great competition in order to obtain jobs in the Federal and State agencies, while there is relatively lower competition to join lower-paying departments and agencies that have high crime rates. Perspective applicants will have better opportunities if they have a college education, training in police sciences and/or military experience. Many times work in this occupation is stressful and extremely dangerous. Uniformed officers, detectives, agents, and inspectors are usually scheduled to work 40-hour weeks, but paid overtime is common. Shift work is necessary because protection must be provided around the clock. Junior officers frequently work weekends, holidays, and nights. The annual base salary of a police chief typically varies from \$72,924 to \$92,983. Employment of police and detectives is expected to grow about as fast as the average (9 to 17 percent) for all occupations through 2014. However, the level of government spending determines the level of employment for police and detectives. The number of job opportunities, therefore, can vary from year to year and from place to place. Layoffs, on the other hand, are rare because retirements enable most staffing cuts to be handled through attrition.

The employment of architects is expected to grow about as fast as the average (9 to 17 percent) for all occupations through 2014. Architects provide professional services to individuals and organizations planning a construction project. Their duties require specific skills—designing, engineering, managing, supervising, and communicating with clients and builders. Architects spend a great deal of time explaining their ideas to clients, construction contractors, and others. Architects usually work in a comfortable environment. Most of their time is spent in offices consulting with clients, developing reports and drawings, and working with other architects and engineers. However, they often visit construction sites to review the progress of projects. About 1 in 4 architects was self-employed which is more than three times the proportion for all other professional and related occupations. Licensing requirements include a professional degree in architecture, 3 years of practical work training, and passing all divisions of the Architect Registration Examination. Architecture graduates may face competition, especially for jobs in the most prestigious firms; opportunities will be best for those with experience working for a firm while still in school and for those with knowledge of computer-aided design and drafting technology. Most architects work approximately 40 hours per week, they often have to work nights and weekends to meet deadlines. Median annual earnings of wage and salary architects were \$60,300 in May 2004. Those just beginning in this field can expect to earn considerably less. Some types of construction are sensitive to cyclical changes in the economy. Architects seeking design projects for

office and retail construction will face especially strong competition for jobs or clients during recessions. Those involved in the design of institutional buildings, such as schools, hospitals, nursing homes, and correctional facilities, will be less affected by fluctuations in the economy.

Engineering technicians use the principles and theories of science, engineering, and mathematics to solve technical problems in research and development, manufacturing, sales, construction, inspection, and maintenance. Most engineering technicians work at least 40 hours a week in laboratories, offices, manufacturing or industrial plants, or on construction sites. Some may be exposed to hazards from equipment, chemicals, or toxic materials. Although it may be possible to qualify for certain engineering technician jobs without formal training, most employers prefer to hire someone with at least a 2-year associate degree in engineering technology. Prospective engineering technicians should take as many high school science and math courses as possible to prepare for postsecondary programs in engineering technology. Training is available at technical institutes, community colleges, extension divisions of colleges and universities, public and private vocational-technical schools, and in the Armed Forces. Median annual earnings of electrical and electronics engineering technicians were \$46,310 in May 2004. Median annual earnings of civil engineering technicians were \$38,480 in May 2004. In May 2004, the average annual salary for aerospace engineering and operations technicians in the aerospace products and parts manufacturing industry was \$52,250, and the average annual salary for environmental engineering technicians in the architectural, engineering, and related services industry was \$36,530. Overall employment of engineering technicians is expected to increase as much as the average for all occupations through 2014. Competitive pressures will however force companies to improve and update manufacturing facilities and product designs, resulting in more jobs for engineering technicians.

Security and gaming surveillance officers patrol and inspect property to protect against fire, theft, vandalism, terrorism, and illegal activity. Most security guards and gaming surveillance officers spend considerable time on their feet, either assigned to a specific post or patrolling buildings and grounds. Guards usually work at least 8-hour shifts for 40 hours per week and often are on call in case an emergency arises. Most states require that guards be licensed. To be licensed as a guard, individuals must usually be at least 18 years old, pass a background check, and complete classroom training in various subjects such as property rights, emergency procedures, and detention of suspected criminals. Rigorous hiring and screening programs consisting of background, criminal record, and fingerprint checks are becoming the norm in the occupation. An increasing number of States are making ongoing training a legal requirement for retention of certification. The amount of training guards receive varies. Guards may receive training in protection, public relations, report writing, crisis deterrence, and first aid, as well as specialized training relevant to their particular assignment. Training requirements are higher for armed guards because their employers are legally responsible for any use of force. Armed guards receive formal training in areas such as weapons retention and laws covering the use of force. Because of limited formal training requirements and flexible hours, this occupation attracts many individuals seeking a second or part-time job. Median annual earnings of security guards were \$20,320 in May 2004. Gaming surveillance officers and gaming investigators had median annual earnings of \$25,840 in

May 2004. Employment of security guards and gaming surveillance officers is expected to grow as fast as the average for all occupations through 2014 as concern about crime, vandalism, and terrorism continues to increase the need for security. Casinos will continue to hire more surveillance officers as more States legalize gambling and as the number of casinos increases in States where gambling is already legal.

Because there exists barriers to employment for women, there are organizations that offer training for women who do not have the necessary skills to enter these non-traditional occupations. Some of these jobs have barriers to employment, such as vocational-training, extreme physical requirements, U.S citizenship, job specific licensing, and clean criminal records. However, since the gender discrimination is presumably on its decline, it is import to provide women with the training that they need to find employment in high paying, non-traditional occupations . Women In Nontraditional Employment Roles, Los Angeles Trade Tech College, and LA Infrastructure Academy are programs that can help facilitate women who want to enter non-traditional fields or fields with low demand for women workers.

V. Models of Vocational Education

Although much of the technical and vocational training available in the United States is government funded, private and non-profit organizations provide vital roles in their respective communities. While approaches vary, states offer vocational training through community colleges and often through their own institutes of technology. Although general vocational courses are offered in some junior high and high schools, education reforms have recently put more emphasis on academics. The “School to Work” program offers initiatives such as spending time on a job site without pay to create a stronger link between academics and work. The majority of federal involvement in technical and vocational training is through the Carl D. Perkins Career and Technical Education Act of 1984. This Act provides \$1.3 billion in federal support for the purpose of increasing the quality of technical education in the United States. President Bush re-authorized the Act in 2006, and Congress unanimously voted to extend it through 2012. The Association for Career and Technical Education is the largest private organization of its kind in the United States. The organization focuses on building a competent and educated workforce for the Country’s future. Community-based organizations and non-profits such as Women in Non-Traditional Employment Roles (WINTER) provide valuable training and mentoring for non-college bound and adult women seeking careers in high-skill and high-wage industries.

Women in non-traditional employment roles, Inc.(WINTER) is a non-profit economic development agency. WINTER was established since 1986 and has been the only nontraditional employment for women organization serving Southern California. WINTER has partnerships with employers, unions and apprenticeship programs. WINTER provides vocational education to non-college bound students and women. Among the services provided are workplace competency skills, construction trade awareness, other non-traditional career instruction as well as opportunity to earn a high school diploma. The goal is not only to find employment for women and girls in non-traditional careers but also for them to become advocates and leaders in their communities.

WINTER offers intensive Career and Technical Training, ranging in duration from 1 to 12 weeks. The training covers vital skills such as life skills, personal assessment, job retention skills, safety instruction, financial literacy, credit counseling and hands on training on construction trades and environmental remediation. They provide individuals with career plans that outline employment and education objectives to help women achieve long-term economic stability. Along with the outline they offer services such as workshops on career planning, on-site job readiness and job searches, and provide a linkage to a wide selection of union apprenticeship programs and employers.

Many of the young women and teens that turn to WINTER for education and job training are often dealing with personal issues and challenges that prevent them from completing WINTER programs. The problems vary but can be anything from drug addiction and anger issues to lack of self-esteem or professionalism. WINTER offers support programs for these individuals to help them overcome the obstacles impeding them from reaching their goals. They provide assistance with work attire and tools, transportation, training stipends, tuition assistance for non-traditional classes and ESL, employment referrals and placement and most important monthly face to face support group with women mentors.

WINTER also provides services that offer gender-specific programs for women and teens interested in technology, math, science, and non-traditional careers. These programs provide personal and leadership development for more than 100 girls and women in Southern California communities. These girls and women also participate in mentoring activities such as leadership, training, prevention programs, career and technical education, college visits, team-building and community service projects. The mentors are women that are trained experienced tradeswomen and women in non-traditional careers such as carpenters, electricians, engineers, architects, law enforcement officers, etc., these women are committed to seeing women succeed in non-traditional occupations.

WINTER also engages in community outreach programs, to promote information about opportunities available to young women in high-wage, high-skill employment and education. One very important aspect of the community is schools; WINTER works with eleven school districts providing workshops and presentations on non-traditional employment opportunities. Students have the opportunity to engage in small group exercise and discussions that encourage them to examine their own beliefs about gender roles, power and discrimination. Students also have the choice to participate in workshops that teach tool recognition and safety. These workshops also help students become aware of their employee rights and they are given resources should they need further help. WINTER also collaborates with universities, community colleges, and other higher education institutions. WINTER also works with other local agencies to provide information sessions for various community groups such as domestic violence, homeless shelters, church groups, and other community based organizations. In order to cater to women, they go to places such as laundromats, childcare centers and beauty salons. The WINTER trainees and students actively participate in community service projects. Aside from the typical clean-ups, they participate in tree planting, construction of playgrounds, and other beautification projects.

An important resource that WINTER makes use of is the Rosie the Riveter Charter High School. This is an accredited high school that works closely with community partners to create an environment in which young women can receive valuable training in non-traditional career paths. The School focuses on building and construction but offers a wide range of career training including engineering, firefighting, and law enforcement. Maintaining a 20:1 student-teacher ratio provides students with a personal and engaging learning process that is uncommon in most high schools. The School's goal is to have every student enter into a registered apprenticeship program or transfer to a college or university.

VI. Conclusion

It is clear that vocational training is an important tool that can be used to increase the labor market opportunities of non-college bound youths. It is important to prepare high-school graduates with the vocational skills needed for the changing workforce, such as computer literacy. We should create more school-to-work programs that help students who are not college-bound find well-paying jobs. For example, Youth Jobs provides CalWORK youth an opportunity to transition into the workforce through paid work-based learning through summer employment opportunities coupled with basic skills remediation, career planning, and employment readiness skills. In addition, community colleges have often been a major provider of vocational and technical training. We should continue to encourage partnerships between community colleges and local businesses to establish and develop job-training courses that address employers' needs for industry-specific training.

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