

analysis

Teaching the Forgotten Half

Career and Vocational Education in Nevada's High Schools

by **Robert Schmidt, Ph.D.**

Executive Summary

Public education in Nevada for years has ignored the particular nature of its community job base. The Las Vegas labor market, for example, is unique in manifesting the lowest demand for college professionals of any labor market in America.

What are in demand instead are individuals who have good practical and technical skills. Yet, of Clark County School District's 280,000 students last year, only 6,000 were able to pursue vocational education within the district.

This situation — a curriculum designed to almost completely discount the actual employment needs of Southern Nevada — is a particular instance of a more general problem that underlies all of Nevada's education woes. Because K-12 education is almost entirely government-based rather than market-based, it naturally and habitually ignores the kind of marketplace signals that private-sector businesses actively adapt themselves to serve. By convention we call this education system "public," but it actually operates on statist principles that disregard the choices that the public, as individuals, would prefer to make.

In this white paper we address just one consequence of that institutional indifference: the plight, in Nevada, of what are increasingly referred to as "the forgotten half" — the high-school youth predominantly bound, immediately at least, for the work-force, rather than college. These are the individuals who would most immediately benefit if alternative career

and technical educational options were made available within the current system.

Actually, "the forgotten half" is a misnomer. In 2005, about seven out of ten jobs in the U.S. and nearly eight out of ten jobs in Nevada, privileged on-the-job training or work-related experience over a traditional high school education. And despite rhetoric from some quarters of the education community, Nevada has an abundance of college graduates — given the fact that only around 15 percent of jobs require a bachelor's degree or more. Indeed, many current college graduates are employed in positions that do not require a college degree and where compensation is below average.

In recent decades the assumption has spread in America that most students must attend college. For many students, of course, the best education does mean college-level academics. For others, however, the most meaningful, fulfilling and enabling education, upon leaving high school, is less academic than practical and technical. Much data, therefore, suggest that a significant segment of our young would be better prepared for success if allowed to pursue skills preparation in areas of vocational technology (including basic math and literacy skills) — rather than being tracked into the current higher education environment.

For these reasons, this report examines the state of contemporary vocational education and the alternatives available to Nevada educators.



Nevada Policy Research Institute

The Nevada Policy Research Institute is an independent research and educational organization dedicated to improving the quality of life for all residents of the Silver State through sound free-market solutions to state and local policy questions. The Institute assists policy makers, scholars, business people, the media and the public by providing non-partisan analysis of Nevada issues and by broadening the debate on questions that for many years have been dominated by the belief government intervention should be the automatic solution.

Committed to its independence, the Nevada Policy Research Institute neither seeks nor accepts any government funding. It enjoys the support of individuals, foundations and businesses who share a concern for Nevada's future and recognize the important role of sound ideas. The Institute is a nonprofit, tax-exempt organization under Section 501(c)(3) of the Internal Revenue Code. For more information on programs and publications of the Nevada Policy Research Institute, please contact:

Nevada Policy Research Institute
1700 E. Desert Inn Rd.
Suite 405A
Las Vegas, Nevada 89169
(702) 222-0642 ♦ Fax (702) 227-0927
www.npri.org ♦ office@npri.org

Teaching the Forgotten Half:

**Career and Vocational Education
in Nevada's High Schools**

by

Robert Schmidt, J.D., Ph.D.

Nevada Policy Research Institute

October 2006

I. Introduction

Recent studies confirm that Nevada youth entering the workplace as new labor market entrants lack adequate, appropriate basic skills and/or work experience.¹ Nevada also continues to rank at or near the bottom of the list in the typical measures of educational success. In educational attainment, for example, only 18.6 percent of Nevada residents over 25 years of age have college degrees, versus 25.9 percent nationally. Also, only 39 percent of Nevadans attempt college immediately after high school versus the national average of over 58 percent.²

These statistics reveal the chronic inadequacy of K-12 and higher education in Nevada. As remedies, many politicians and members of the educational establishment suggest a variety of traditional and generic responses, such as increasing course requirements, raising teacher salaries, offering full-day kindergarten or increasing the overall amount of instructional time.

Unfortunately, all of these responses fail to address or even acknowledge the more fundamental and structural problem that underlies all of Nevada's education woes: Because our K-12 education system is almost entirely government-based rather than market-based, it remains essentially impervious, functionally, to the kind of marketplace signals that private-sector businesses actively adapt themselves to serve. Though we call this education system "public," it actually operates on bureaucratic and statist principles that disregard the choices that the public, as individuals, would prefer to make.

An immediate example is the plight of "the forgotten half" — the high-school youth, in Nevada and elsewhere, who are predominantly bound for the work-force, rather than college. We believe that the Silver State public education establishment needs to facilitate the rise of a more adaptive, flexible and market-sensitive approach to meeting the immediate educational needs of these young people.

This "forgotten half" of youth, as Paulter³ reminds us, can particularly benefit from alternative career and technical educational options rather than a traditional education within the current system. In 2005, about seven out of ten jobs in the U.S., and nearly eight out of ten jobs in Nevada, privileged on-the-job training or work-related experience over a traditional high school education.

Only around 15 percent of jobs in Nevada require a bachelor's degree or more.⁴ Despite rhetoric coming from some interests within the education community, there is an abundance of college graduates in Nevada. Indeed, many are employed in positions that do not require a college degree and where compensation is below average.⁵

In recent decades the assumption has spread in America that most students should attend college. For many students, of course, the best education does mean college-level academics. For others, however, the most meaningful, fulfilling and enabling education upon leaving high school, is less academic than practical and technical. Much data, therefore, suggest that a significant segment of our young would be better prepared for success if allowed to pursue skills preparation in areas of vocational technology (including basic math and literacy skills) — rather than being tracked into the currently configured higher education environment.

It is important to remember that a majority of workers in the U.S. workforce lacked even an 8th grade diploma until the 1950s. It was not until the end of the 1960s that a majority of workers had high school diplomas or general equivalency diplomas (GED). In 1970, only 10.7 percent of the population had a college degree — a number that had more than doubled, to nearly 25 percent, by 2000. In 2002, more than 26 percent of the U.S. workforce had a bachelor's degree or higher. In Nevada, the current total is 18.6 percent.

Nevertheless, the median household

The Silver State public education establishment needs ... a more adaptive, flexible and market-sensitive approach to meeting the immediate educational needs of young people.

income in Southern Nevada in 2000 was \$44,600 compared with \$41,994 nationally.

These figures suggest the latent demand in Nevada for an improved K-12 system that would allow students to choose quality career and vocational education rather than merely the one-size-fits-all college-preparatory program. Moreover, opening up such vocational education opportunities for all Nevada students would not mean the closing of any doors, post-high school, to future work or study. Instead, it would mean opening of doors for students to far greater possibilities.

Because exposing students to career and technical education actually encourages rigorous and engaged learning, it creates a rich foundation upon which students can then build — making connections between classroom learning and real-world work opportunities, and contemplating the life that comes after school.

The Nevada government education estab-

lishment has been marked by resistance to vocational education for many years. Energizing that resistance, too often, have been a conceit and an intolerance. The conceit presumes that the limited knowledge issuing out of academic life is necessarily superior, for all people, to the limited knowledge issuing out of practical and technical learning. On that basis, the intolerance then denies opportunity and the chance for financial success to those whose preferences might lead them more directly, at present, into the world of work.

Such attitudes have made vocational education into Nevada's educational stepchild, wandering in multiple forms in and out of the general education system. With a system that allows funding to accompany choices by the student and his or her family, Nevada can change that. And at the same time it empowers students and parents, such a system will also empower the Silver State's own economy.

Vocational education [has been] Nevada's educational stepchild, wandering in multiple forms in and out of the general education system.

Background

Vocational education is defined by Webster's dictionary as "*training for a specific vocation in industry or agriculture or trade*" (Webster, 2003). The practice of such training dates back to the ancient Egyptians, Babylonians, and Asians. During this era the ruling leaders of government felt little or no need for organized education, yet there was still a need for skilled tradesmen. Skills were learned in the form of an apprenticeship, usually from a father or master craftsman. The goal of the apprentice was to become skilled enough to prove valuable.

Prior to the Industrial Revolution, the apprenticeship system and the home were the principal sources of vocational education. Since then the decline of handwork and the specialization of occupational functions has forced society to develop institutions of vocational education. Manual training, involving general instruction in the use of hand tools, developed initially in Scandinavia. It became popular in the elementary schools of the United States after

1880. While the immediate object of this training was not vocational, it developed gradually into extended courses in industrial training. Courses in bookkeeping, stenography, and allied commercial work in both public and private institutions were other early forms of vocational education.

Among the early American private trade schools were Cooper Union (1859) and Pratt Institute (1887). Hampton Institute (1868) and Tuskegee Institute (1881) were pioneers in industrial, agricultural, and home economics training for African Americans. The agricultural high school (1888) of the University of Minnesota was the first regularly established public vocational secondary school and introduced extensive public instruction in agriculture. Since 1900 the number of public and private vocational schools has greatly increased.

Although the 1862 Morrill Act, which established land-grant colleges, represented the first effort by the federal government to ensure vocational education, nothing further was done until the Smith-Hughes Act

As we enter the 21st century, vocational education in the United States is in transition ... toward broader preparation that develops the academic, vocational, and technical skills of students.

(1917), which provided federal financing for industrial, home economics, and agricultural courses. This aid was extended in the George-Deen Act (1936) to include teacher education and training for certain other occupations. Vocational correspondence courses, which were formed in great numbers to meet the growing demand for training, often were poorly designed and without value. These were improved under the informal supervision of the National Home Study Council (1926) working with the Federal Trade Commission.

Further advances in the techniques of vocational education were made by the armed services during World War II. The need for technicians was so great that civilian life could not supply them, and special training methods stressing graphic presentation and practical work were used to meet the demand. Further impetus to vocational training resulted from the Servicemen's Readjustment Act of 1944 (popularly, the G. I. Bill of Rights), which allowed World War II veterans to receive tuition and subsistence during extended vocational training.

Subsequent bills provided funds for the vocational education of veterans of the Korean and Vietnam wars. The Manpower Development Training Act (1962), the Vocational Education Act (1963), the Vocational Education Amendments (1968), and the Carl D. Perkins Vocational and Applied Technology Act (1984) have helped to upgrade the nation's workforce and ensure that vocational training is available for economically or physically challenged young people.

In recent years, corporations and labor organizations have established the majority of new vocational and cultural centers. In addition, many of the public high schools offering vocational training have undergone a variety of changes. Almost all have placed renewed emphasis on a student's meeting general academic standards as well as learning a trade. Many schools have shifted the emphasis of their programs from the traditional construction trades to computers and related technologies, and some schools have moved away from vocational training entirely.

Modern Vocational Education

Large communities frequently have separate public schools (college and high schools) devoted to specific occupational fields, and some counties and states sponsor regional vocational training establishments. These public schools work closely with interested industries and trades in establishing curricula and in guidance and employment programs. The cooperative training technique, (in which students work part-time in the job for which they are preparing), is a common feature of these programs. Junior or community colleges now often provide vocational training courses. Many industries have instituted extensive vocational education programs for their employees, and virtually all trades require apprenticeship and/or on-the-job training.

Theorists in vocational training have emphasized that its aim is to improve the worker's general culture as well as to further his or her technical training. That policy

is evident in the academic requirements of public vocational schools and in the work of public continuation and evening schools. Various academic courses are provided so that workers who have not completed the public school requirements may do so while engaged in regular jobs. In some localities attendance at continuation schools is compulsory for those who are of school age. While continuation and evening schools are often primarily vocational, they frequently include general courses that attract older workers.

As we enter the 21st century, vocational education in the United States is in transition. Historically, the purpose of vocational education has been to prepare students for entry-level jobs in occupations requiring less than a baccalaureate degree. Over the last 15 years, however, this purpose has shifted toward broader preparation that develops the academic, vocational, and technical skills of students. Many so-called "vocational"

skills are now complex or highly technical in nature; preparation involves integrating academic and vocational education, emphasizing all aspects of an industry, and implementing academic performance measures.

Vocational education policy now also encourages high school students to continue their studies at the postsecondary level, and

2-year postsecondary students to pursue 4-year credentials, through various arrangements for secondary-postsecondary articulation or “tech prep.” The traditional focus of vocational education is giving way to a broader purpose, one that includes greater emphasis on academic preparation and provides a wider range of career choices.

Vocational Ed and At-risk Youth

In the traditional view, children at risk were considered the primary candidates for vocational education. Research has clearly proven that identifying at-risk youth at an early age may be the key to their success in the classroom. It is believed that all students will be at risk during some point in their educational life. Research has shown that the following conditions contribute to the high dropout rate in this country (Druian and Butler, 1987):

- ◆ Living in high-growth states
- ◆ Living in unstable school districts
- ◆ Being a member of a low income family
- ◆ Having low academic skills (though not necessarily low intelligence)
- ◆ Having parents who are not high school graduates
- ◆ Speaking English as a second language
- ◆ Being the children of single parents
- ◆ Having negative self-perceptions; being bored or alienated; having low self-esteem
- ◆ Pursuing alternatives: males tend to seek paid work as an alternative; females may leave school to have children or get married.

Certainly, a majority of Nevada’s youth are subject to many of these “conditions” as a matter of course — characteristics that contribute profoundly to the state dropout rate. Yet adverse fates for at-risk youth are not inevitable.

Contrary to views often advanced within

the education establishment, at-risk students continue to defy the traditional education setting, bringing a distinct mindset to defining what constitutes educational success for themselves. In studies by Kauffman and Hallahan (1976), students who were disabled, including students in the at risk/high risk population, had a difficult time staying on task during academic activities in the classroom. Researchers agree that, for students who lack the trust or ability to succeed in the traditional school setting, career and vocational education services should be recommended.

Currently, about 30 percent of all students in the traditional high school setting will drop out prior to graduating, with the percentage higher for black and Hispanic students. Indicators forecast an even higher dropout rate in the coming years.

While Nevada will be subjected to substantial economic costs if it continues to fail to educate these youth, expanding their vocational education options finds a clear rationale in the state’s economy.⁶ According to the U.S. Department of Labor’s Bureau of Labor Statistics, approximately 20.8 million of the 21.6 million new wage and salary jobs generated over the 2006-2016 period will be in the service-providing vocations. More and more vocational jobs are shifting away from producing goods, and the need for services is growing.

This great demand for people who can provide services is precipitated by population growth, population aging-in-place and the ever-changing world of technology. What many students and parents should now realize is that with the right vocational skills, students can move into rewarding and lucra-

Currently, about 30 percent of all students in the traditional high school setting will drop out prior to graduating...

Vocational programs that prepare students for manufacturing jobs are less in demand than those that prepare students for jobs in the services and information industries.

tive careers without a college degree.

Generally, the research literature describes a trend toward greater education and training requirements and a greater need for critical thinking, personal responsibility, and social skills among workforce participants. For example, many recent projections anticipate that average growth will be greater for occupations requiring at least an associate's degree.

The United States has shifted from a manufacturing-based economy to one that is now overwhelmingly adapted to providing services and information. This has two important implications for education programs. It signals an ongoing shift in the education and training fields required of the nation's workforce. It also signals shifts in the levels of that education and training. Vocational programs that prepared students for manufacturing jobs are less in demand than those that prepare students for jobs in the services and information industries. And those latter jobs — health care technology is a prime example — are significantly more demanding than for occupations requiring less education. However, these trends are not

uniform across industries and occupations, and experts disagree about their magnitude. While some emerging occupations require high education and training requirements (such as a bachelor's degree or moderate- to long-term on-the-job training), many jobs still require only relatively low education and training levels. In 1996, 39 percent of all jobs required no more than short-term on-the-job training.⁷

These economic and labor market trends provide a context for analyzing trends in vocational education. If participation in vocational programs can adaptively parallel changes in the economy, for example, one would expect to see a decline in enrollments in trade and industry programs and an increase in enrollments in service- and information-related programs. Similarly, if vocational education is able to adaptively reflect the labor market trend toward greater education and training requirements, one would expect to find academic preparation of students in vocational education increasing, with more of these participants seeking and obtaining higher education and training credentials.

II. The Nevada Context

High Tech Jobs in the Silver State

Generally, high technology jobs in the United States are tied to mathematics and science applications. As shown in Table I below, 80 job titles related to math and/or science are projected to employ 7,469,000 individuals in the United States in 2014, an increase of 891,000 from the 6,789,000 employees in 2004. The 7,469,000 represents **4.5 percent** of total United States employment projected for 2014 (165,540,000 employees in 760 job titles). The 2004 math and/or science employment of 6,758,000 was estimated at **4.6 percent** of 2004 total employment (146,612,000 workers).

Most workers in math and/or science occupations are anticipated to be employed in computer-related occupations (53.6 percent in 2014). Nevertheless, many of these employees are not expected to possess a traditional four-year college degree.

Many educators in effect justify the scarcity of high tech jobs in Nevada with references to failings of Nevada and American education systems and to the high percentage of Chinese and Indian college graduates with engineering and science degrees. Their premise is that there is a shortage of highly skilled American high tech workers and graduates. However, a January 2006

report from Duke University published in *Education Week* refutes that view. “U.S.-Asian Engineering Gap Overstated,” said the headline, with the article continuing, “Business leaders and politicians in the United States could be scaring away high school students from pursuing math- and science-related careers by focusing on the large numbers of engineers produced by China and India and the loss of such U.S. jobs to

outsourcing, a report says.”

Moreover, there is little correlation between theoretical mathematics, K-12 science education and high tech jobs. About 5 percent of jobs in the United States in the 2000s might require higher theoretical mathematics and or science course work.

Most jobs in the United States workforce require only short-term or moderate length

There is little correlation between theoretical mathematics, K-12 science education and high tech jobs.

Table I
Math & Science Employment in the United States 2004-2014

Occupational Areas	U.S. 2004 Employment	U.S. 2014 Employment	%	Change	%	Number/ Job Titles
Architecture	220,000	255,000	3.4	38,000	17.8	4
Engineers	1,440,000	1,644,000	22	195,000	13.4	18
Engineering Technicians	532,000	595,000	7.9	63,000	11.8	12
Physical Scientists	250,000	281,000	3.8	30,000	12.2	7
Life Scientists	232,000	280,000	3.7	48,000	20.8	12
Physical. & Life Technicians	342,000	291,000	3.9	49,000	14.4	10
Computer Occupations	3,046,000	4,003,000	53.6	957,000	31.4	11
Math Scientists & Tech.	107,000	117,000	1.6	10,000	9.7	6
Totals	6,758,000	7,469,000	99.9	891,000	13.5	80
Total U.S. Employment	145,612,000	164,540,000		18,928,000	13.0	760
Percent Total U.S. Employment	4.6 percent	4.5 percent				

Source: Bureau of Labor Statistics, *Occupational employment projections to 2014*, Monthly Labor Review, November 2005.

on-the-job training or experience. About 21 percent of jobs might require a bachelor’s degree or more. About 31 percent of workers in 2002 had a Bachelor’s degree or more.

The great majority of the jobs of the future will be the same jobs that the 20th Century has seen — with the addition of new technological tools that will make these jobs easier to do, not more difficult. The United States Bureau of Labor Statistics’ Projection of Employment 2004 to 2014 shows that the jobs of the United States in 2014 will essentially be the same jobs that exist in 2004. Thus, most 2014 jobs will require short-term on-the-job training or experience or moderate-length on-the-job training, experience or education.

The great numbers of high paying jobs of the future that supposedly will require college graduation and high academic skills for all high school students are a great exaggeration.

Since most of the jobs in Nevada and the United States in coming years will still be modest or average paying jobs that only require short- or moderate-term on-the-job training, they will not require high-level academic skills in any academic areas, particularly in higher mathematics. The projections of high-skill job employment shortages in the future may also be significantly lowered because of outsourcing of jobs for cheaper labor and higher profits, not for more highly educated or productive workers.

Table II
U.S. Occupations with the Largest Job Growth, 2004 to 2014, in Rank Order

Rank	Occupation	Employment		Change		May 2004	Training
		2002	2012	Number	%	Median wage	Source
1	Retail-Salespersons	4,256,000	4,992,000	736,000	17.3	\$18,680	ST- OJT
2	Registered Nurses	2,394,000	3,096,000	703,000	29.4	\$52,330	Bach./Associate Degree
3	Postsecondary Teachers	1,628,000	2,153,000	524,000	32.2	VH Quar- tile*	Doctoral
4	Customer Service Representatives	2,063,000	2,534,000	471,000	22.8	\$27,020	Moderate OJT
5	Janitors & Cleaners	2,374,000	2,813,000	440,000	18.5	\$18,790	ST OJT
6	Waiters & Waitresses	2,252,000	2,627,000	376,000	16.7	\$14,050	ST OJT
7	Food Prep/Serving & Fast Food	2,150,000	2,516,000	367,000	17.1	\$15,690	ST OJT
8	Home Health Aids	624,000	974,000	350,000	56.0	\$18,330	ST-OJT.
9	Nursing Aides, orderlies attendants	1,455,000	1,781,000	325,000	22.3	\$20,980	Post Sec. Voc
10	General & Operations Mgs	1,807,000	2,115,000	308,000	17.0	\$77,420	Bachelor's/Exp
11	Personal & home care aides	701,000	988,000	287,000	41.0	\$16,900	ST-OJT
12	Elementary teachers except Special Ed	1,457,000	1,722,000	265,000	18.2	\$43,160	Bachelor's deg
13	Accountants & Auditors	1,176,000	1,440,000	264,000	22.4	\$50,770	Bachelor's deg.
14	Office Clerks, general	3,138,000	3,401,000	263,000	8.4	\$22,770	ST-OJT
15	Laborers -freight, stock, movers hand	2,430,000	2,678,000	248,000	10.2	\$20,120	ST-OJT
16	Receptionists & Information clerks	1,133,000	1,379,000	246,000	21.7	\$21,830	ST-OJT
17	Landscape & Groundskeeping Workers	1,177,000	1,407,000	230,000	19.5	\$20,420	ST OJT
18	Truck drivers, heavy & tractor trailer	1,738,000	1,962,000	223,000	12.9	\$33,520	Moderate-OJT
19	Computer Software engineers	460,000	682,000	222,000	48.4	\$74,980	Bachelor's
20	Maintenance / Repair workers, general	1,332,000	1,533,000	202,000	15.2	\$30,710	Moderate--OJT
21	Medical Assistants	387,000	589,000	202,000	52.1	\$24,610	Moderate-OJT
22	Exec. Secretaries & Adm. Assistants	1,547,000	1,739,000	192,000	12.4	\$34,970	Moderate-OJT
23	Sales Reps, Wholesale/Manufacturing	1,454,000	1,641,000	187,000	12.9	\$45,400	Moderate-OJT
24	Carpenters	1,349,000	1,535,000	186,000	13.8	\$34,900	Long -term-OJT
25	Teacher assistants	1,296,000	1,478,000	183,000	14.1	\$19,410	ST-OJT
26	Child Care Workers	1,280,000	1,456,000	176,000	13.8	\$16,760	ST-OJT
27	Food preparation workers	889,000	1,064,000	175,000	19.7	\$16,710	ST-OJT

28	Maids, Housekeeping workers	1,422,000	1,587,000	165,000	11.6	\$16,900	ST-OJT
29	Truck drivers, light or delivery service	1,042,000	1,206,000	164,000	15.7	\$25,540	ST-OJT
30	Computer system analysts	487,000	640,000	153,000	31.4	\$66,460	Bachelor's
Totals:		46,897,000	55,7229,000	8,832,000	18.3%		

Source: Bureau of Labor Statistics, *Occupational employment projections to 2014*, Monthly Labor Review, November 2005.

*VH Quartile \$43,600 or more

If changing workplace practices have implications for the skills required of employees, such workplaces are still a minority.

Summary:

U.S. occupations with the largest job growth, 2004 to 2014

Training Source	Number	2004	Employment percent	2014	Percent
Short Term On-the-Job	15	26,163,000	56	30,568,000	55
Moderate Term On-the-Job	6	8,521,000	18	9,998,000	18
Bachelor's Degree	5	5,387,000	12	6,599,000	12
Associate Degree	1	2,394,000	5	3,096,000	6
Doctoral	1	1,628,000	3	2,153,000	4
Post Secondary Vocational	1	1,455,000	3	1,781,000	3
Long-Term On-the-Job	1	1,349,000	3	1,535,000	2
Totals	30	46,897,000		55,729,000	

In 2004 the top 30 jobs employed about 46,897,000, representing 32.2 percent of the total U.S. employment — 145,612,000 in about 775 job titles. In 2014 the top 30 jobs

are expected to employ 55,729,000, representing 33.9 percent of the projected total U.S. employment — 164,540,000 in, again, about 775 job titles.

Employer Perspectives

Many education scholars have argued that changes in the economy and in education are altering workplace practices in ways that have implications for the skills required of employees. Increased global competition has spurred some U.S. businesses to create “high-performance workplaces,” relying on flexible and decentralized work practices and multi-skilled workers. These firms, however,

are still in the minority. For example, 20 percent of surveyed employers reported engaging in performance-benchmarking in 1997, and 25 percent had undergone reengineering. Larger firms were more likely than smaller firms to report these practices, indicating that the percentage of employees affected by these practices may be greater than the percentage of employers reporting them.

Only a minority of firms reported participating in federally subsidized 'school-to-work' activities.

The 1994 School-to-Work Opportunities Act advocated employer involvement in school-to-work partnerships and wider implementation of work-based learning, including job shadowing, mentoring, internships, and apprenticeships. Once again, however, only a minority of firms reported participating in these activities. In 1997, one-quarter of surveyed employers said they participated in a school-to-work partnership, while 42 percent reported providing at least one formal work-based learning activity. As above, larger firms were more likely than smaller firms to report these different practices.

While the general labor market trend may be toward higher education and training requirements, employers have a unique perspective, which is particularly important in the short term. When hiring frontline workers from an established applicant pool, surveyed employers did not rate years of completed schooling or academic performance as highly as attitude and communication

skills. However, it may be that years of completed schooling and academic performance are more important during initial applicant screening. It may also be that employers have historically found that schooling measures are not reliable indicators of what students know and can do.

With an evolving economy and its changes in education and skill requirements, attention over the last two decades has focused on whether employees are adequately prepared for the demands of the workplace. According to most surveyed employers, the proficiency of their production workers either stayed the same or increased in recent years. In addition, the majority of employers with new production employees who participated in work-based learning reported that these employees were superior to comparable new hires in terms of productivity and attitude. Virtually no employers reported that employees with work-based learning experience were inferior in these two respects to comparable new hires.

Return on Investment

Postsecondary students can choose from many types of educational institutions. These include public and private not-for-profit four-year institutions that offer primarily bachelor's degrees or higher, and public two-year institutions (usually called "community colleges") that offer mainly associate's degrees and vocational certificates.

Other less-than-four-year institutions typically offer certificate programs that can be completed in about a year of full-time enrollment, though some of these institutions offer associate's degrees as well. Most of these are private institutions operating for profit and are commonly known as "trade" or "proprietary" schools.

In both 1990 and 2000, approximately one-half of all full-time dependent undergraduates attended public four-year institutions, and about one-quarter attended private not-for-profit four-year institutions. Between 1990 and 2000, the proportion attending public two-year institutions (community colleges) increased, while the proportion

enrolled at private for-profit less-than-four-year institutions decreased. The decline in the proportion attending private for-profit less-than-four-year institutions may reflect in part the decline in the number of such institutions from 5,544 in 1990 to 4,343 in 2000 (U.S. Department of Education 2003, table 5). The number of public two-year institutions increased from 968 to 1,068, and the number of four-year institutions remained approximately the same (about 600 public and 1,500 private not-for-profit institutions).

Among full-time dependent undergraduates in the lowest family income quartile, the percentage attending private not-for-profit four-year institutions declined between 1990 and 2000 from 28 to 23 percent. Similarly, the percentage attending private for-profit less-than-four-year institutions dropped from 9 to 5 percent. During this same period, however, the percentage attending public two-year institutions increased from 16 to 25 percent.⁸ Lower income students may have reacted to rising tuition by choosing institutions with lower prices (either within

or across sector). Still, price is only one of many factors students consider in choosing a college.

Tuition and fees represent the price that institutions charge students before any grant aid is taken into account. Fees — charges assessed for services such as laboratory expenses, health services, exercise facilities and art studios — may not be the same for all students. The amounts used in the following analysis are the actual charges to individual students and therefore reflect whether they paid in- or out-of-state tuition.

Dependent undergraduates who attended full time in 1990 were charged an average of \$1,100 in tuition and fees at public two-year

institutions, \$2,900 at public four-year institutions, and \$12,000 at private not-for-profit four-year institutions. By 2000, the averages had risen to \$1,600, \$4,300, and \$15,900, respectively. The apparent increase at private for-profit less-than-four-year institutions (from \$7,300 to \$8,000) is not statistically significant.

There is little doubt that two year institutions are increasing in popularity. Recent studies suggest this is in large part due to the greater perceived return on investment for graduates. Many have found that a two-year degree in nursing is much more valuable in the marketplace than a four year degree in English Literature.

III. What Should Nevada Do?

The New Model of Career and Technical Education

Career and vocational education is an elective program that provides middle, high school, and adult learners with training in a particular career. According to the National Center for Education Statistics (NCES), approximately 11 million people are served by the vocational education system in the United States.

American high school students earn more credits in English than any other subject. The second highest number of credits earned by U.S. high school students are — amazingly — career and technical education or “CTE,” today’s label for classes that teach work-related applied knowledge and skills. According to NCES, the overwhelming majority of American high school students (98 percent) take one or more career and vocational education classes during high school.

Nationally 15,000 secondary schools offer vocational education courses, including some programs offered through area vocational centers, which serve students from a number of local schools at one central site. Approximately 20 percent of all high school course work nationally is career and techni-

cal education-related. Each year roughly \$13 billion is spent on career and technical education across the country — three-fifths of it at the secondary level. The federal government provides about seven percent of the funding, mainly through the Carl D. Perkins Vocational and Technical Education Act, thus leaving most funding to states and local districts. Patterns vary greatly across the country. For example, in New Hampshire all vocational program funding comes from local school districts, while in Ohio, a large portion is provided by the state.

Any evaluation of career and vocational education trends in most of the United States reveals great diversity in program content, delivery and organization. In some states, where traditional approaches and curricula prevail, performance problems are found very similar to those of traditional schools.

In other states, however — Minnesota and Ohio are examples — completely new programs are being developed that place students in technology facilities far removed from the old woodworking and metalworking “shop” classes of the 1950s and 1960s. Some of these innovative programs in CTE

Many students have found that a two-year degree in nursing is much more valuable in the marketplace than a four year degree in English.

Students in CTE-based schools graduate at a higher rate than those at comparable traditional high schools.

incorporate basic skill training in meaningful ways that need to be considered as potential new educational models.

Most of the programs' goals are directly related to the issues that face youth as they seek to complete high school and transition to employment conditions. Nevertheless, many programs still do not incorporate sufficient exposure to career-related material and information.

Careers require varying levels of educa-

tion. Some students will gain enough training to enter the workforce immediately following high school, while others may require a four-year college degree.

Students may elect to take only a single course or a concentration in a particular trade. Areas of concentration most frequently offered by vocational education programs focus on business, trade and industry, health, agriculture, family and consumer sciences, marketing, and technology.

What Works: An Emerging New CTE Model

Contemporary career and vocational education covers more than 30 areas of study including business, carpentry, information technology, and health occupations. Although public opinion persistently regards vocational education as the course of study for the non-college bound, of the 25 percent of U.S. high school students who major in vocational education, 63 percent attend college following high school.

"CTE is a huge part of the enterprise of American high schools," says James Stone, associate professor of career and technical education and director of the National Center for Career and Technical Education (NCCTE) in the College of Education and Human Development at the University of Minnesota.

Stone's most significant research focuses on how CTE-based school reforms can improve important student outcomes, such as math aptitude and graduation rates. His most recent research shows that all-school reforms based on CTE can have a profound impact on America's most at-risk students.

What Works is an ongoing, five-year longitudinal study that compares student progress in high schools using CTE-based all-school reforms with student progress in traditional high schools, all of which have a large percentage of at-risk students. Preliminary findings include:

- ◆ Students in CTE-based schools graduate at a higher rate than those at comparable traditional high schools.
- ◆ More students in CTE-based schools took math every year and fewer opted

out of the math sequence than their counterparts in traditional high schools.

- ◆ In a CTE-based school where 60 percent of incoming freshmen read at or below the fourth-grade level, they regained their grade-level skills and graduated at a higher rate than their counterparts at traditional high schools.

In a study called the Math-in-CTE project, Stone and colleagues are testing the possibility that students' math aptitude will improve if math is taught not as a separate subject, but "extracted" in the context of CTE classes. (Typical CTE classes focus on hands-on skills.) An example of this method has students building a pig barn using algebra and geometry to figure out how much concrete is needed for the project, rather than simply focusing on the skill of pouring the concrete.

In 2005, Stone and his colleagues conducted a pilot study in which 250 teachers and 4,000 students in 12 states were randomly assigned to experimental or control conditions. During the semester-long study, teachers in the experimental schools used a new curriculum that extracted math from normal CTE topics, while CTE teachers in the control schools did nothing different. After the pilot period, students were tested using three different math assessments.

Findings from the pilot study were promising:

- ◆ Overall, students in the experimental classrooms scored significantly higher on the college placement exam.

- ◆ The results of individual assessments of the six simultaneous study replications showed a statistically significant pattern of improvement in math skills of students in the experimental schools over students in the control schools.
- ◆ Students in four of the six replications scored significantly higher than students in the control classrooms on one or more of the math assessments. The test averages of students in the experimental classrooms show positive improvement in math knowledge, with two of the six sites showing significant improvement.
- ◆ The study showed that technical aptitude achievement did not suffer in the experimental schools, rather, two of the six sites showed significant improvement in technical knowledge.

Stone expects the yearlong study to yield even greater differences in achievement and generate a definitive set of parameters from which to build a strong math-enriched CTE curriculum.

Conclusion

As Nevada enters the 21st century, the state faces some key issues:

- ◆ Will its public education system continue promoting traditional educational

programs at the expense of demonstrated student need — and market demand — for alternative approaches to secondary education?

- ◆ Will state and district programs continue channeling funds into limited vocational education programs that serve only a small percentage of the general student population?
- ◆ Will state policymakers recognize the real source of the state's problem in the area of career and technical education? That the top-down, command-and-control structure of Nevada's public education system is, by its nature, institutionally deaf to the expressed needs and preferences of individuals who do not control their own educational funding?

All successful business enterprises find a way to be led by their publics, i.e., by signals from the choices made by free individuals in a competitive marketplace. For many years, however, the Nevada education establishment has operated with institutionalized indifference to many of the publics it nominally serves. One such public: students who have goals other than immediate entrance into college.

Nevada has ignored innovative CTE reform for too long. It is time for intelligent reform to begin.

Will state policymakers recognize the real source of the state's problem in the area of career and technical education?

Robert Schmidt, J.D., Ph.D.

Robert Schmidt is a cofounder and president of The Theodore Roosevelt Institute. Bob holds advanced degrees in economics, sociology, and law. He has numerous academic appointments including Senior Research Fellow, Claremont Graduate University, School of Politics and Economics; Visiting Professor of Management and International Corporate Governance, Helsinki School of Economics, International Business Campus, and Assistant Professor and Graduate Faculty, UNLV. He is the author of numerous articles and treatises on regional and urban issues including education and financing of urban infrastructure. He has served as an advisor to numerous federal, state and local governments and commissions.

Prior to founding The Theodore Roosevelt Institute, Bob held several senior level positions in the private sector, including as COO of Dytel Corporation, a mid-sized telecommunications firm; CEO of Reynolds and Taylor, a mid-sized manufacturing firm. He also was Senior Manager-in-Charge of Management Consulting with Price Waterhouse and Assistant Vice President for ECOLAB Europe.

End Notes

- 1 See for example Schmidt; Schmidt & Barr; Stone et al
- 2 U.S, Census Bureau 2000 Census
- 3 Paulter, A.J. (1994) Improving the school-to-work-transition for the forgotten half; In Albert Paulter (editor) High School to employment transition: contemporary issues; Ann Arbor, Mi Prakken (pp201-205)
- 4 U.S.Census 2000
- 5 We fully understand and endorse the concept of life-time learning, etc. The statement above reflects the reality of current employment profiles. Our primary concern is the relative lack of focus on the “forgotten half”.
- 6 Vocational education is defined by the National Center for Education Statistics as “Organized educational programs, services, and activities which are directly related to the preparation of individuals for paid or unpaid employment, or for additional preparation for a career, requiring other than a baccalaureate or advanced degree.”
- 7 Bureau of Labor Statistics, OES Data 1996
- 8 In both 1990 and 2000, 47 percent of low-income dependent students attended public four-year institutions.



Analysis is published by the Nevada Policy Research Institute (NPRI) to evaluate government policies and proposals for reform. Nothing published herein should be construed as necessarily reflecting the views of NPRI as a corporate entity or as an attempt to aid or hinder the passage of any

particular item of legislation. Please contact NPRI for reprint permission or further information. The Nevada Policy Research Institute was founded in 1991 to promote individual liberty, public understanding of free markets and the many alternatives that exist to governmental coercion.