The Demand for Middle-skills Jobs

in the United States and Texas

A State of the Workforce Report

Texas Workforce Investment Council

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State of the Workforce Report

The Demand for Middle-Skills Jobs in the United States and in Texas

Section I: Intent and Structure of the Report

The Texas Workforce Investment Council (Council) functions as the state's Workforce Investment Board under the federal Workforce Investment Act of 1998. The Council's purpose is to assist the Governor of Texas with system planning, evaluation and review of the Texas workforce. State of the Workforce reports are produced by the Council to spotlight various aspects and emerging issues within the state's workforce system. This State of the Workforce report focuses on middle-skills jobs, using materials from the Council's Information Repository (IR), an electronic research library of reports, white papers, articles and briefs. These items are culled from federal and state agency websites, in addition to numerous public policy and educational electronic databases. IR topic areas include: adult education, child care, economic development, federal legislation, higher education, K-12 education, local workforce boards, state legislation, Temporary Assistance to Needy Families (TANF), and training.

Intent and Structure of the Report

This report is divided into four sections:

- Section I is comprised of the intent and structure, and introduction of the report
- Section II is a description of the need for middle-skill jobs and data that supports this assertion
- Section III is a discussion of how Texas addresses its need for middle-skill jobs
- Section IV is a discussion of issues and challenges relating to meeting the need for middle-skill jobs and a conclusion

Introduction

Many interesting topics regarding workforce development are in the news today, and one in particular that is receiving increased attention is that of middle-skill jobs. This State of the Workforce Report discusses the importance of middle-skills jobs in the context of current workforce challenges, both in Texas and the United States. Middle-skill jobs are the backbone of the American economy because they provide the basic infrastructure for critical economic sectors, such as manufacturing, energy, aerospace, oil and gas, and construction. Middle-skill jobs are absolutely crucial to sustaining the economy and expanding it.

Middle-skill jobs are those that require some education and training beyond a high school diploma, but less than a four-year baccalaureate degree.[1] This postsecondary learning may include simply "some" college coursework, two-year associate's degrees, certificates, on-the-job training, or apprenticeships. High-skill occupational categories include management and financial operations, in addition to professional and related occupations. Low-skill categories include service occupations, farming, fishing and forestry. Middle-skill categories include the following: sales and related occupations, office administrative support, construction, installation and repair, production occupations, and transportation and material moving.[2] There are overlapping areas between low-, middle- or high-skilled jobs which may or may not require a four-year degree, just as there are individuals who are working above or below their educational level.

[1] "*America's Forgotten Middle-Skill Jobs: Education and Training Requirements in the Next Decade and Beyond,*" Harry J. Holzer and Robert I. Lerman, Skills2Compete Campaign of the Workforce Alliance, November 2007, p.3.
[2] Ibid, p. 9.

The focus of this paper is on middle-skill jobs that fall into two broad categories: skilled crafts and trades, and technicians and operators. Examples of skilled crafts and trades are: construction and building inspectors, electricians, plumbers, pipefitters, steamfitters, manufacturing supervisors, machinists, welders, cutters, solderers, and brazers. Examples of technicians and operators include: air traffic controllers, petrochemical process and operations technicians, engineering technicians, dental hygienists, radiation therapists, diagnostic medical sonographers, registered nurses, radiologic technologists and technicians, respiratory therapists, fire fighters, and forensic science technicians.

Section II: Description of Need for Middle-skill Jobs

Labor Market Need

There is a general misconception in America that middle-skill jobs are disappearing from the country's labor market. Many Americans assume with much of United States (US) manufacturing gone overseas and American textile and steel industries almost at a stand-still that middle-skill jobs are diminishing in number and importance to the economy. Nevertheless, high demand for middle-skill jobs remains and in fact, many of these jobs pay quite well. The Bureau of Labor Statistics (BLS) indicates that middle-skill jobs have declined from 55 percent to 48 percent since 1986, yet this percentage still represents nearly half of all jobs in America.[3] Furthermore, with the Baby Boomer population (1946-1965) approaching retirement and over 70 million workers projected to retire over the next decade, many middle-skill jobs will become vacant and require replacement workers. Adding to the phenomenon of the Baby Boomer retirement is the pattern that the immigrant population in the US tends to fall at either the high or low end of the education spectrum. This in turn positions immigrants to fill high- or low-skill jobs and not middle-skill jobs. Since demographers are projecting that between the years 2010 and 2030 all US labor growth will be attributed to first- and second-generation immigrants,[4] heightened attention to middle-skills jobs is timely.

Certain middle-skill occupations in fields such as health care will actually experience above-average growth due to the aging of the large Baby Boomer population. Other middle-skill occupations projected to grow at above-average rates will be in construction, information technology and transportation. In their article, *America's Forgotten Middle-Skill Jobs*, Harry J. Holzer and Robert I. Lerman cite the following statistics for the years between 1986 and 2006:

- Registered nursing (both with and without bachelor's degrees) experienced a gain of 1 million jobs, up from 1.5 million
- The health technician field gained 600,000 jobs, up from 400,000
- Emergency and health diagnosing positions grew by 40 percent
- Construction jobs, including those requiring classroom and on-the-job training grew by nearly 50 percent

The authors note that BLS projects roughly 45 percent of all job openings by the year 2014 will be for middle-skill workers, while high-skill job openings will be approximately 33 percent and low-skill job openings will be about 22 percent.[5] For example, net growth in various health care jobs requiring training beyond high school but less that a four-year degree, is expected to vary from 20 to 40 percent and account for more than 1.5 million job openings. Thus, given the impending retirements of Americans born after World War II and that the demand for middle-skill jobs will remain strong, the prognosis of a robust labor market for individuals with education beyond high school but less than college, is certain.

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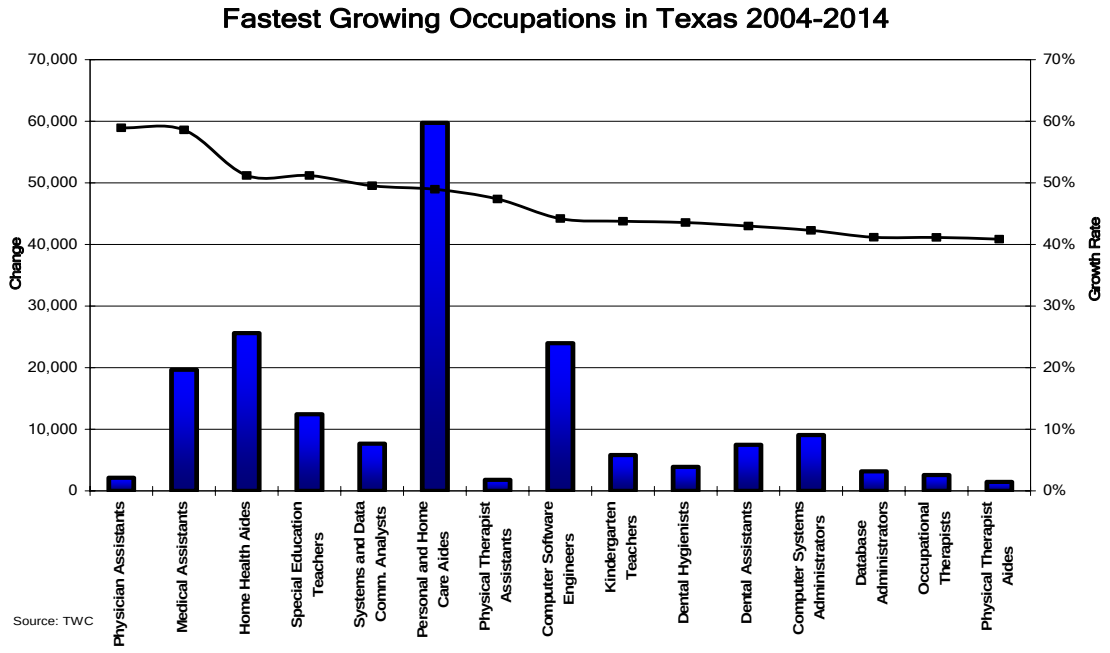
[3] *America's Forgotten Middle-Skill Jobs*, p. 12.
[4] LEP Guide for Workforce Professionals, Texas Workforce Solutions, p. i.
[5] *America's Forgotten Middle-Skill Jobs*, p. 15.

Below is a bar graph indicating 15 of the fastest growing occupations in Texas, of which half are middle-skill jobs requiring more education than high school, but less than a four-year baccalaureate degree:



Since middle-skills jobs account for roughly half of the fastest growing occupations, the more training and education options Texans have to move into these positions, the more competitive the state's economy will be.

Employer Perspectives

Since the 1890s, the US has been the world's leading economy due mainly to its expansive energy and manufacturing industries, both traditionally solid bastions of middle-skill labor. Texas has been home to two great American industries, petrochemical and aerospace, and with its tremendous population growth Texas' economy continues to rely on middle-skill jobs. These industries, along with the others named in the Governor's industry cluster initiative, harbor many middle-skill jobs. The cluster industries include advanced technologies and manufacturing, aerospace and defense, biotech and life sciences, information and computer technology, petroleum refining and chemical products and energy. Construction is an integral part of each of the six clusters and is an industry that depends heavily on middle-skill jobs.

Energy

In the fall of 2007, the US Department of Labor hosted an Energy Skilled Trades Summit to gather leaders from southeastern states, including Texas, to address the industry's skilled labor needs. According to the *Southeast Work Force White Paper* presented by key energy and construction stakeholders, this region is facing a crisis of insufficient numbers of skilled trade workers to meet both the current and future demands of growth in the energy sector. Right now skilled workers are needed to build infrastructure, install equipment, operate facilities or make repairs necessary to maintain the industry's current pace. Skilled energy craft and trade occupations in the region include: boilermaker, carpenter, chemistry technician, electrical maintenance technician, electrician, heavy equipment operator, instrumentation and control technician, insulator, ironworker, line worker, mechanical maintenance technician, millwright, non-destructive examination technician, pipefitter, power plant operator, process

technician, quality assurance technician, quality control technician, radiation protection technician, and welder.[6]

The paper explains that demand for skilled labor falls into three areas, construction, operation, and maintenance, and these three areas span all facets of the energy industry including fossil power, nuclear power, transmission, distribution, pipelines and petrochemical refining. The Construction Labor Research council, for example, projects that 185,000 new construction craft workers are needed nationally in order to replace the 95,000 workers who are retiring, and to guarantee one to two percent growth in the workforce between 2005 and 2015.[7]

The *Southeast Work Force White Paper* also emphasizes that the demand for skilled workers is exacerbated by the looming retirement of the Baby Boomer generation. To illustrate, the paper points out that the American Public Power Association expects half of its technical workforce to retire in three to five years, while the Nuclear energy Institute says that about 35 percent of its workforce will retire in the next five years, or nearly 20,000 people.[8] One of the greatest concerns of the industry is the fact that these retirees will be taking with them knowledge and skills cultivated over a lifetime.

In addition to the problems of demand and attrition in its workforce, the energy industry faces more subtle challenges related to the problem of attracting skilled craft and trade workers. As cultural values have shifted over the last fifty years, the image of a well-paying skilled job as a desirable career option has faded. A four-year college degree has increasingly become the preferred outcome for students and families. Technical occupations—even those that are high-paying—have come to be viewed as second rate. According to the paper, the values of younger Americans known as Generation X and Generation Y, do not fall in line with the same notions of lifetime commitment to one industry or company held by older Americans. These generations expect to change jobs several times over their lives. Furthermore, they expect a great deal from their employers including the chance to work with the latest technology at the earliest opportunity, and not necessarily on the condition of spending the time it took the Baby Boomers to "work their way up" to similar privileges.

The authors of the *Southeast White Paper* caution that relying on current education and training programs will not be an adequate solution to the impending scarcity of skilled labor for industry. The nation's education system at large should emphasize developing new approaches to linking career and technical education both in high school and postsecondary institutions to careers in energy. According to the paper, career and technical education, with a shorter turn-around time and classes structured to teach the immediate needs of business and industry will be an important educational pathway for Generation X and Y.

Aerospace

In February of 2008, the Interagency Aerospace Revitalization Task Force led by the US Department of Labor, released a report with many common parallels to the *Southeast Work Force White Paper*. Like energy, the aerospace industry is one of the pillars of the American economy with vast roots reaching to and supporting the massive defense and civilian aerospace sectors. The aerospace industry is facing labor shortages as well, not only because it draws closer to the "demographic cliff" with its workforce approaching retirement, but because US schools are not producing enough graduates fluent in science, engineering, technology and math. Aerospace needs high-skill scientists and engineers, but it also needs middle-skill workers such as engineering technicians, machinists, tool and die makers, technical writers,

[6] *Southeast Work Force White Paper*, Energy Skilled Trades Summit, August 27-28, 2007.
[7] Ibid.
[8] Ibid.

air traffic controllers, aircraft mechanics and service technicians. According to the Taskforce, aerospace employers are "biased" in believing that traditional education, that is, a four-year degree, is the best pathway for entry into the industry. The Taskforce has outlined strategies to ensure a steady pool of aerospace workers and specifically mentions a continuous reassessment of workforce challenges, including solutions of changing skill needs in response to innovation, technology and global market changes. The authors write, "There needs to be a stronger focus on credentials based on industry identified competencies, as well as alternative education and training pathways, such as those available through apprenticeships and career and technical education."[9]

"Green" Energy

Greener Pathways: Jobs and Workforce Development in the New Clean Energy Economy, is a March 2008 collaborative report produced by the Center on Wisconsin Strategy, the Workforce Alliance and the Apollo Alliance. It explores the potential for jobs in three increasingly talked-about "green" energy fields: energy efficiency, wind sector and biofuels. A greener American economy will indeed produce jobs, and "green jobs are family-supporting, middle-skill jobs" requiring investment in "the backbone of America's labor force: workers with more than high school, but less than a four-year degree."[10] The authors state that while new jobs will be created, developing this industry will involve adapting existing jobs and existing curricula to include "green" skills. For example, in terms of energy efficiency, many retrofitting jobs are essentially construction jobs that will involve occupations ranging from boilermakers, electricians, plumbers and pipefitters to sheet metal workers.[11] In wind turbine production, jobs are very similar to traditional manufacturing jobs and include machinists, computer-controlled machine tool operators, drilling and boring machine tool setters, operators and tenders.[12] These are also all middle-skill jobs. In the biofuels sector, middle-skill jobs are akin to chemical manufacturing jobs, such as mixing and blending machine setters, operators and tenders, chemical technicians, and chemical plant and system operators.[13]

While much of the success of so-called greener pathways remains to be seen, it is clear that middle-skill jobs such as those now building and maintaining infrastructure in America will have their place and play a critical role in the growth of the US economy.

Section III: Texas Addresses the Need for Middle-Skill Jobs

In line with the rest of the country regarding middle-skills jobs, Texas will feel the large Baby Boomer retirement and the commensurate drain upon the skilled workforce. However, Texas is growing and expects to increase its population by 35 percent from around 20,852,000 in 2000 to 28,064,000 by 2015.[14] Texas is also becoming much more diverse. The state's Hispanic population will increase from 32 percent of the total population in 2000 to 42 percent by 2015 and Texas currently has the third largest African-American population in the country.[15] These statistics are significant because of the fact that while Hispanic and African-Americans are about 53 percent of the total population, according to the Texas Higher Education Coordinating Board, this demographic comprises a less proportionate 36 percent of state college and university enrollments. The state's higher education plan, *Closing the Gaps by 2015*,

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[9] *Report of the Interagency Aerospace Revitalization Task Force*, p. 10-11.
[10] *Greener Pathways: Jobs and Workforce Development in the New Clean Energy Economy*, Sarah White and Jason Walsh, Center on Wisconsin Strategy (COWS), Workforce Alliance, and the Apollo Alliance, March 12, 2008, p. 3.
[11] Ibid., p. 16.
[12] Ibid., p. 26.
[13] Ibid., p. 38.
[14] *Strategic Plan for Texas Community Colleges – 2007 to 2011*, Texas Higher Education Coordinating Board, p. 8.
[15] Real Estate Center, Texas A&M University website, http://recenter.tamu.edu/mnews/mnsearch.asp?AID=33&TID=12.

has specific achievement goals for the entire population as well as for segments underrepresented in postsecondary education and training. Texas' goals for participation are as follows:

- Increase the overall Texas higher education participation rate from 5 percent to 5.2 percent (150,000 students) by 2005, to 5.5 percent (175,000 students) by 2010, and to 5.7 percent (180,000 students) by 2015.
- Increase the higher education participation rate for the Black population of Texas from 4.6 percent to 5.1 percent (22,200 students) by 2005, to 5.4 percent (15,000 students) by 2010, and to 5.7 percent (19,300 students) by 2015.
- Increase the higher education participation rate for the Hispanic population of Texas from 3.7 percent to 4.4 percent (101,600 students) by 2005, to 5.1 percent (120,000 students) by 2010, and to 5.7 percent (120,000 students) by 2015.
- Increase the higher education participation rate for the White population of Texas from 5.1 percent to 5.2 percent (24,100 students) by 2005, to 5.4 percent (35,000 students) by 2010, and to 5.7percent (35,000 students) by 2015.[16]

Texas' goals for success in *Closing the Gaps* are as follows:

- Increase the number of students completing bachelor's degrees, associate's degrees and certificates from 95,000 to 120,000 by 2005; to 140,000 by 2010; and to 163,000 by 2015.
- Increase the number of Black students completing bachelor's degrees, associate's degrees and certificates from 9,000 to 11,000 by 2005; to 14,000 by 2010; and to 16,000 by 2015.
- Increase the number of Hispanic students completing bachelor's degrees, associate's degrees and certificates from 18,000 to 26,000 by 2005; to 36,000 by 2010; and to 50,000 by 2015.
- Increase by 50 percent the number of students who achieve identifiable successes other than with certificates and degrees by 2015. Exceed the average performance of the 10 most populous states in workforce education provided by community and technical colleges.[17]

In order to achieve these goals for both participation and success, it is critical that there be multiple options for students. A spotlight on middle-skills jobs, clarifying pathways to two-year and four-year degrees as well as to technical and workforce training and certification, opens doors for everyone by creating more viable pathways to success. Texas needs workers of all skill levels to remain prosperous and competitive in the 21st century.

Secondary Education

In primary school and in preparation for secondary school, students in Texas share the same subject focus as students all over America and the world: science, technology, engineering and math, referred to commonly by the acronym, STEM. This is in response to the fact that our global economy is increasingly a knowledge-based economy, and education, in all variants and classifications, will be essential.

Beyond the fundamental emphasis on STEM, Texas will need to address issues of lagging high school completion rates. The US Census Bureau 2006 American Community Survey indicates that 75.7 percent of Texans 25 or older have completed high school.[18] Given that middle-skill jobs require education or training beyond high school and considering the fact that middle-skill jobs make up half of all jobs in Texas, high school completion is a critical state policy concern.[19] The AchieveTexas program is based

[16] *Closing the Gaps by 2015*, Texas Higher Education Coordinating Board, p. 9.
[17] Ibid., pp. 11-12.
[18] US Census Bureau website, http://quickfacts.census.gov/qfd/states/48000.html.
[19] The Workforce Alliance Website, www.workforcealliance.org.

on the national States' Career Cluster initiative, designed to link the knowledge secondary students acquire in high school with what they will need to know for success in careers and college. The clusters identify pathways between high school and two- and four-year college degrees, plotting a roadmap for students to follow as they embark upon the occupation of their choice. Texas has 16 Career Clusters and Programs of Study which offer students information and guidance for grades 9-16 and beyond. The programs are evaluated and updated annually and partnerships and counselors are available to students throughout their tenure in school.[20]

Texas has developed the Advanced Technical Credit Program, a system of articulation in which certain enhanced CTE high school programs have been aligned with corresponding community college courses to allow the secondary student a seamless transition to a postsecondary institution. The classes are only offered in technical or workforce areas and not in academic areas such as history and social studies. The program only applies to participating community colleges and the classes must be taught by teachers who meet state-mandated requirements.[21]

Also at the state level, the Texas Legislature recently created the Career and Technical Education Review Panel as part of an effort to address low high school graduation rates and improve the rigor and academic quality of CTE courses offered in high school. This legislative initiative is aimed at increasing awareness that hard data now shows how much CTE improves student attendance, student scores on tests, and therefore, increases graduation rates. In general, CTE can significantly boost secondary students' ability to reap the most of their postsecondary experiences, as well as their immediate prospects in the Texas job market.

Private-public initiatives can contribute to preparing young people for middle-skill jobs as well. The Texas High School Project has brought together numerous private foundations and the Texas Education Agency in a collaborative effort to increase graduation rates and college enrollment rates. There are several early college high schools in Texas, located on community college campuses that are designed to let students simultaneously earn a high school diploma and a two-year Associate's degree, or acquire two years of credit toward a bachelor's degree.

Postsecondary Education

Postsecondary education in Texas is multi-faceted. There are 143 public and independent institutions of higher education in the state, including 50 public community college districts, 31 public four-year universities, 4 public two-year, upper-division universities, four Texas State Technical College System campuses, nine public health-related institutions, 3 public two-year lower-division Lamar state colleges, 39 independent four-year colleges and universities, 1 independent medical school, and 2 independent junior colleges. Students may pursue traditional academic degrees or professional and career degrees from four-year institutions, or they may pursue academic associate degrees and certificates from two-year institutions. Community and technical colleges are the prime source of preparation for middle-skills jobs in Texas. They offer two-year associate degrees, and also offer continuing education classes for individuals who wish to hone skills, acquire new skills, or make career changes. Workforce and technical education programs both complement and enhance academic preparation by allowing students to apply academic principles along with the technical skills that are critical to career success. Such programs put learning and knowledge in context, enabling students to see the relevance of their academic studies in relationship to their career goals.

[20] AchieveTexas website, http://www.achievetexas.org/index.html.

[21] ACT website, http://www.atctexas.org/.

Tech-Prep is one of these types of programs in Texas. According to its website, Tech-Prep is a way for students to begin a college technical major in high school and continue into college by combining academic classes and technical courses to receive a certificate or associate degree in preparation for a career. College credit can be earned through dual credit classes, College Board Advance Placement, or content-enhanced articulated courses. Articulation in this context refers to a course plan available to students where they sign an articulation agreement stipulating they will take and meet the requirements of certain courses taught in high school that a postsecondary institution will then recognize. This ensures the student a seamless transition from secondary to postsecondary institutions, avoiding duplication of coursework and delay. Essentially, Tech-Prep is a college preparatory plan for high school students giving them a jumpstart on a two-year associate of applied science degree, or an apprenticeship. It can also be the basis of a four-year program of study, or it can provide the student with technical skills for entry-level employment after high school.[22]

Apprenticeships

Designed to ready individuals for occupations in skilled trades and crafts, registered apprenticeships offer a combination of rigorous and relevant on-the-job training with classroom instruction on the theoretical and practical aspects of these occupations. All apprenticeships must be registered through the US Department of Labor (DOL) Office of Apprenticeship. These programs are voluntary and industry driven, and in Texas about a third of apprenticeship training programs are administered by the Texas Workforce Commission, using state general revenue funds. Many apprenticeships are for occupations that fall into the Governor's six target high-growth industry clusters (advanced technologies and manufacturing, aerospace and defense, biotech and life sciences, information and computer technology, petroleum refining and chemical products and energy) making the apprenticeships true partnerships between industry, education and state government. As employees, apprentices sign a contractual Apprenticeship Agreement and are supervised by experienced journeyworkers. After one to four years (or 2,000 to 8,000 hours) and a DOL-approved amount of classroom time, the worker is awarded an Apprenticeship Completion Certificate. This is recognized nation-wide since it is issued by a federally approved state apprenticeship council, agency or DOL itself. It is possible for apprenticeship programs to offer dual accreditation that can eventually be applied toward completion of an associate's degree. Examples of apprenticeships in Texas include aircraft assembler, automobile mechanic, carpenter electrician, laboratory technician, nurse assistant, pipe fitter, plumber, and telecommunications technician. According to the US DOL Office of Apprenticeship there are 415 programs and 12,271 apprentices in Texas.

Section IV: Challenges and Opportunities in the Middle-skills Job Market

Image

The concept of middle-skills jobs—what they are, what potential they have, what kind of people are in them—is plagued with an image problem. In response to this concern and out of its well-known *2005 Skills Gap Report*, the National Association of Manufacturer's (NAM) initiated its "Dream It Do It" media campaign. NAM researchers discovered that over 80 percent of its members had difficulty finding appropriately skilled workers during the last recession. NAM surveys indicated that most young people had nightmarish images of working assembly-lines, which they described as "serving a life sentence" or being a "slave to the line." Adults were not much more positive and when asked about manufacturing's contribution to the US economy, they responded that they "just have no idea." The organization's conclusion was that the American educational system simply fails to engage students and also fails to help

[22] Tech-Prep Texas website, http://www.techpreptexas.org/index.shtml.

young people find alternative postsecondary programs.[23] On a national level, programs such as the Dream It Do It campaign with its interactive website and seven regional offices (one coming to north Texas soon) work well to promote high- and middle-skill jobs within the manufacturing industry.

Challenges

With regard to middle-skills jobs in Texas, the state faces numerous challenges. Demographically, Texas has two issues to deal with: Baby Boomer retirement and an ensuing drain upon the skilled workforce; and a surge in the young Hispanic and African-American population that is typically underrepresented in higher education. However, growth in Texas' population is clearly an asset, particularly when compared to the problem of a waning population that so many of the American plain states are experiencing. The challenge for Texas is to significantly increase success in secondary and postsecondary education within a racially, ethnically and culturally diverse population.

With challenges such as these, opportunities abound for innovative and wide-ranging educational programs. To this end, *Closing the Gaps by 2015* seeks to increase minority participation and success in higher education by setting specific benchmarks for enrollment and degree awards over the next few years. Still, more articulated programs to ease transition from secondary to postsecondary institutions are necessary. The value of workforce and technical education needs emphasis, not only to highlight the benefits of transitioning from high school to college, but also for its value in preparing individuals for entry into the workforce.

In its most recent article, *Thrive: the Skills Imperative*, the Council on Competitiveness directly addresses the importance of the middle-skills worker today:

> The time has come to stop thinking of them as blue collar, and start thinking of the people as technology workers. These positions create solid career opportunities for millions of Americans. Community colleges must become an integral partner in expanding the technology workforce. And the nation must put a high priority on ensuring public-private partnerships to fund adequate training programs for what are likely to emerge as critical shortages.[24]

Texas needs robust programs supporting the full range of postsecondary education and training options to prepare Texans for high-wage, middle-skill occupations.

Conclusion

In Fiscal Year 2007, the Council made two recommendations to the Governor regarding funding for secondary and postsecondary education and training, as well as for community and technical colleges. These recommendations remain highly relevant as the changing global economy impacts the daily lives of all Texans:

- The Council recommended that the Governor advocate for the value and appropriate funding of postsecondary education and training, and for the spectrum of options available to Texans to attain the skills and knowledge necessary to compete in a global economy.

[23] *Keeping America Competitive-How a Talent Shortage Threatens US Manufacturing: Part I,* National Association of Manufacturers white paper, April 24, 2003, p. 2
[24] *Thrive: the Skills Imperative*, Council on Competitiveness, April 2008, page 15.

- The Council concurred with the request for funding and support for Texas community and technical colleges made by the Texas Higher Education Coordinating Board in their Legislative Appropriations Request for FY 2008 and FY 2009.[25]

In step with the rest of America, Texas will benefit from raising the image of skilled craft and trade worker, technician and operator, as viable, stable, and both economically and socially valuable occupations. Educational initiatives such as AchieveTexas, will heighten public awareness of the abundant postsecondary opportunities for Texans. Media campaigns such as Dream It Do It can improve and polish the outmoded image that stigmatizes middle-skill jobs at this time.

In keeping with problem-solving in relation to labor market changes is the concept of innovation. As researchers at the Brookings Institute write, innovation is not limited to new products and concepts—it may include simply finding different ways to achieve certain objectives.

> Innovation is also essential if we are to create a future of better jobs for all Americans. Properly conceived, innovation is not just about creating more jobs for engineers and managers in high technology industries. It is also about providing more and better training for incumbent workers in manufacturing…[26]

From this, Texas can use focus and attention directed to middle-skills jobs as a way of maintaining the state's prosperous and competitive position in the ever-changing global economy.

[25] *Texas Workforce Investment Council Annual Report*, Fiscal Year 2007, p.3

[26] *Boosting Productivity, Innovation, and Growth Through a National Innovation Foundation*, Robert Atkinson and Howard Wial, Brookings Information Technology & Innovation Foundation, April 2008, p. 4.

List of References

Atkinson, Robert and Wial, Howard (2008), *Boosting Productivity, Innovation, and Growth Through a National Innovation Foundation*. Retrieved on April 25, 2008 from http://www.brookings.edu/reports/2008/04_federal_role_atkinson_wial.aspx.

Energy Skilled Trades Summit (2007), *Southeast Work Force White Paper*. Retrieved March 25, 2008 from http://www.workforceflorida.com/bcs/calendar_docs/070823_AgendaPacket.pdf.

Holzer, Harry J. and Lerman Robert I. (2007), *America's Forgotten Middle-Skill Jobs, - Education and Training in the Next Decade and Beyond*. Retrieved March 25, 2008 from http://www.workforcealliance.org.

National Association of Manufacturers (2003), *Keeping America Competitive – How a Talent Shortage Threatens US Manufacturing: Part I*. Retrieved on April 8, 2008 from http://www.nam.org/s_nam/sec.asp?CID=201721&DID=230273.

National Association of Manufacturers (2005), *2005 Skills Gap Report – A Survey of the American Manufacturing Workforce*. Retrieved on April 8, 2008 http://www.nam.org/s_nam/bin.asp?CID=89&DID=235731&DOC=FILE.PDF.

Texas Higher Education Coordinating Board (2000), *Closing the Gaps by 2015*. Retrieved on February 12, 2008 from http://www.thecb.state.tx.us/reports/PDF/0379.PDF .

Texas Higher Education Coordinating Board (2006), *Strategic Plan for Texas Community Colleges – 2007-2011*. Retrieved on February 12, 2008 from http://www.thecb.state.tx.us/reports/PDF/1197.PDF .

Texas Workforce Solutions, (2007), *LEP Guide for Workforce Professionals*. Retrieved on April 25, 2008 from http://www.twc.state.tx.us/boards/guides/lep_guide_all.pdf.

Texas Workforce Investment Council (2007). *Annual Report 2007*. Austin: State of Texas.

US Department of Labor, (2008), *Report of the Interagency Aerospace Revitalization Task Force*. Retrieved March 25, 2008 from http://www.dol.gov/ .

White, Sarah and Walsh, Jason (2008), *Greener Pathways*. Retrieved on March 30, 2008 from http://www.cows.org/greenerpathways/ .

Online References

AchieveTexas website, http://www.achievetexas.org/index.html.

ACT website, http://www.atctexas.org/.

Real Estate Center, Texas A&M University website, http://recenter.tamu.edu/mnews/mnsearch.asp?AID=33&TID=12.

Tech-Prep Texas website, http://www.techpreptexas.org/index.shtml.

The Workforce Alliance website, http://www.workforcealliance.org.

US Census Bureau, http://quickfacts.census.gov/qfd/states/48000.html.