

# **American Competitiveness in the 21<sup>st</sup> Century and Key Texas Initiatives**

*A State of the Workforce Report*



## **Table of Contents**

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<b>Section 1: Intent and Structure of the Report</b>	<b>1</b>
<b>Section II: Texas Workforce Investment Council's Information Repository</b>	<b>1</b>
<b>Section III: American Competitiveness in the Global Economy</b>	<b>2</b>
<b>American Education</b>	<b>2</b>
<b>Skills and Training of the Workforce</b>	<b>3</b>
<b>Section IV: Significant Recommendations from the IR and Related Texas Initiatives</b>	<b>4</b>
<b>Recommendations on American Education</b>	<b>4</b>
<b>Recommendations on Skills and Training of the Workforce</b>	<b>10</b>
<b>Concluding Comments</b>	<b>14</b>
<b>List of References</b>	<b>16</b>

**State of the Workforce Report**  
***American Competitiveness in the 21<sup>st</sup> Century and Key Texas Initiatives***

**Section I: Intent and Structure of the Report**

**Introduction**

The Texas Workforce Investment Council (Council) is the state's Workforce Investment Board under the federal Workforce Investment Act of 1998, and as such, is charged with assisting the Governor with system planning, evaluation and review. The Council produces State of the Workforce reports periodically, focusing on various facets of the workforce system. This report includes information on the Council's Information Repository (IR) and emerging issues from the IR in 2005.

**Intent and Structure of the Report**

Key themes have emerged in the Information Repository (IR) in 2005 on American competitiveness, the American education system, and skills and training of the workforce. These issues, along with key recommendations and associated Texas initiatives are the focus of this report. The purpose of this State of the Workforce Report is to introduce the Council to the Information Repository, instituted in 2005, and to highlight key findings from the IR for the calendar year 2005. The report is divided into four sections:

- Section I introduces the intent and structure of the report
- Section II describes the methodology and structure of the Information Repository
- Section III introduces some principal findings from the IR during 2005 on American Competitiveness
- Section IV discusses significant recommendations from the various studies, and the initiatives being implemented in Texas that respond to the recommendations.

**Section II: Texas Workforce Investment Council's Information Repository**

The Council's Information Repository (IR), instituted in January 2005, is designed to be an "early warning" system for emerging workforce issues, providing a streamlined and topic-driven method for cataloging and organizing all retained information. The system is organized into ten key content areas which allow users to quickly scan and locate items. Publications are housed in separate files, by content areas and are categorized by index locator codes.

Information in the IR is collected from 16 primary and 27 secondary websites, which are checked biweekly and monthly. Additionally, the IR contains other materials submitted by Council staff. Website sources include government agencies, associations, research organizations, and other sites representing the content areas relating to the work of the Council. In order to determine whether or not to include an article or report in the IR, the contents are analyzed through four levels of filters to determine relevance. These filters include Council mandates, products and deliverables, system programs and services, legislation, measurements and evaluation, strategic planning, Governor's priorities, Chair-designated priorities, legislative priorities, and analysis of the material. Staff is briefed monthly on publications determined to be of particular importance to the work of the Council, and the Director and Deputy Director are briefed quarterly on issues emerging into state or national prominence. Several critical national and state issues from the IR have emerged in 2005, and these issues are the subject of this report.

### **Section III: American Competitiveness in the Global Economy**

The central issue raised in multiple studies and reports in the Information Repository throughout 2005 is America's position in the global economy and its ability to maintain its competitive edge of innovation and economic leadership. The U.S. economic predominance since World War II has been based on the quality of the American workforce and its education and training system. To maintain that position in the new century, the Council on Competitiveness (June 2005, p. 2) stated that "a flexible, well-educated workforce rewarded at all levels for creative problem-solving to fuel innovation" will be required. Many educational and economic factors have coalesced at this point in time to bring this issue to the forefront:

- About 71 percent of students graduate on time from American high schools
- American secondary students score below most other countries in math and science
- Less than 15 percent of American high school students graduate with the necessary prerequisites to pursue scientific or technical degrees in college
- The number of U.S. students obtaining degrees in science and engineering, other than biological or social sciences, has remained flat or declined since 1985
- Over 50 percent of doctoral degrees granted in engineering and math in the U.S. between 1990 and 2002 were to foreign nationals
- Federal funding for physical science research and development has been flat for years
- Federal funding of discovery research has been in long-term decline, now at only half of its mid-1960s peak, while many foreign governments have been investing heavily in research and development
- Foreign-owned companies now account for nearly half of all U.S. patents
- One out of every five scientists and engineers working in the U.S. is foreign-born
- Many of America's working scientists and engineers, the products of the National Defense Education Act of 1958, are nearing retirement

According to The National Summit on Competitiveness (December 2005, p. 1) "...if trends in U.S. research and education continue, our nation will squander its economic leadership, and the result will be a lower standard of living for the American people." The Council on Competitiveness (December 2004, p. 5) stated "Innovation will be the single most important factor in determining America's success through the 21<sup>st</sup> century."

In response to the issue's prominence and the acceleration of calls at the national level for a renewed commitment to American innovation and competitiveness, the Department of Labor (DOL) introduced the Workforce Innovation in Regional Economic Development (WIRED) initiative in 2005. This initiative's goal is to encourage regionalization of economic development efforts to create clusters of innovation and technology where companies, workers, researchers, entrepreneurs, government and education join together in a single, concerted effort. Up to three grant proposals for each state were submitted by governors for consideration of grant awards of up to \$5 million per year for a three-year period. In February 2006, thirteen regional proposals were selected to receive a total of \$195 million in WIRED grants.

#### **American Education**

The National Governors Association (February 2005, p. 7) estimates the graduation rate for all secondary students to be around 71 percent, 56 percent for African American students, and 52 percent for Hispanic students. International comparative testing reveals a lack of knowledge particularly in math and science, and colleges report a high percentage of entering freshmen not prepared for college-level work. According to an American College Testing Program (ACT)

study (2005, p. 1), only 26 percent of ACT-tested high school graduates were prepared for college biology, 40 percent were prepared for college algebra, and 68 percent were prepared for college English composition. American high school students are not performing well academically when compared to their counterparts in other countries. According to results from the 2003 Program for International Student Assessment (PISA), of the 15 year olds tested, American students ranked 22<sup>nd</sup> in science, 27<sup>th</sup> in mathematics literacy, and 29<sup>th</sup> in problem solving.

American higher education is not producing the numbers of graduates in math, science, and engineering required by U.S. industry. Not enough students are majoring in these degree areas, nor are they finishing the degrees in which they are enrolled. According to ACT (2005, p. 3), of all freshmen entering a four-year college, only about one-fourth return for the second year, and for community colleges, the percentage is closer to one half. The Council on Competitiveness (December 2004, p. 23) states that only 15 percent of high school students graduate with the prerequisites to pursue scientific or technical degrees in college. The number of degrees granted in science and engineering has remained flat or declined since 1985 while the high tech industry grew by 50 percent between 1990 and 2002. India is graduating twice as many students from college while China is expected to graduate three times as many. There are not enough American-born college graduates positioned either to enter the workforce in these fields or to pursue graduate degrees. At the same time, American immigration policy after 9/11 has limited the number of talented foreigners coming to U.S. universities. Foreign applicants to American science and engineering programs have declined by more than 25 percent in three years, limiting another potential pool of talent.

In response to these data trends in the American educational system, the National Governors Association (NGA) undertook the Redesigning the American High School Project as one of the most important issues facing the country. Under the leadership of then-chairman Governor Mark Warner of Virginia, the project published a blueprint in 2005 of ten steps to be undertaken by the Federal government, state governments, and local school districts to update the institution of the high school and align the curricula and requirements with the 21<sup>st</sup> century needs of American business and industry.

### **Skills and Training of the Workforce**

According to ACT in its publication *Crisis at the Core* (2005, p. iii), 70 percent of the 30 fastest-growing jobs will require an education beyond high school and 40 percent of all new jobs will require at least an associate's degree. The results of a 2005 national survey by the National Association of Manufacturers (NAM) (p. i) revealed that current skill shortages cut across industry sectors, impacting more than 80 percent of companies surveyed and their abilities to achieve production levels, increase productivity, and meet customer demands. Today's students must leave school with the skills needed to be successful in today's knowledge-based economy. The Education Commission to the States Issue Brief *State Strategies for Redesigning High Schools and Promoting High School to College Transitions* (January 2005, p. 1) states that the growing importance of knowledge-based work demands employees with the skills of abstract reasoning, problem solving, communication, and collaboration. Increasingly, college readiness also means workplace readiness, with many of the jobs now being created requiring abilities equivalent to those expected of those entering college.

According to the 2005 Skills Gap Report (NAM, p. 17), nearly half of companies surveyed reported their current employees lack basic skills such as attendance, timeliness, and work ethic, while 45 percent reported inadequate problem-solving skills, and another 35 percent reported insufficient reading, writing, and communication skills. According to ACT's *Crisis at the Core*

(2005, p. iii), “While not every student plans to attend college after high school, many of the jobs now being created in a highly technology-based economy require abilities equivalent to those expected of the first-year college student.” During the decade of 1992 to 2002, there was a decrease of 400,000 jobs requiring less than a high school diploma and jobs for high school graduates stayed about the same. At the same time, there was a 2.4 million increase in jobs requiring some college education, a 2.2 million increase in jobs requiring an associate’s degree, and a 2.6 million increase in jobs requiring a technical degree. Steve Gunderson reported in his testimony before Congress in 2005 that the unemployment rate for those with less than a high school education is one-and-a-half times the national average, while those with a college degree experience an unemployment rate of half the national average.

The U.S. education system must realign itself to the realities of the 21<sup>st</sup> century workplace and students must be motivated to succeed in order for America to maintain its capacity to innovate, continue to lead the world economically, and to produce the skilled workers that U.S. employers must have to remain competitive. As Gunderson stated (2005, p. 4), “Thus, while post-high school used to be an opportunity, it is increasingly becoming a necessity. We must change our education commitment from K-12 to P-14.”

#### **Section IV: Significant Recommendations from the IR and Related Texas Initiatives**

Many of the studies and reports contained in the Information Repository on the topics of American competitiveness, education, and skills and training of the workforce contained recommendations. These recommendations were placed in a matrix and were categorized by subject and type. From this process, six significant recommendations emerged, three concerning education and three concerning skills and training of the workforce. These recommendations and the implications to Texas are the subject of this section. Because some of the Texas initiatives described in this section address multiple needs, they have been referenced more than once.

#### **Recommendations on American Education**

- 1. Reform the P-12 curriculum, in mathematics, the physical sciences, and technology**
  - A. Assure that all levels align with one another and that high school exit is equivalent to college entrance and provides necessary workforce skills
  - B. Increase graduation requirements, particularly in math and science
  - C. Advanced placement (AP) and/or dual-credit courses are available to all students and encourage students to take them

A general concern articulated in most studies that were reviewed is that the public school curriculum needs to be rewritten and updated to provide the knowledge and skills that are currently required for both college and workforce preparation. Studies pointed out that the entry-level requirements for high performance workplaces are very similar to those of college entrance, thus negating the concept of separate graduation requirements for college-bound and employment-bound students.

Indeed, the majority of studies cited note that graduation requirements need to be increased to ensure all high school graduates are fully prepared for college entrance or to work in a high performance workplace. According to the U.S. Department of Education in its *Meeting the Challenge of a Changing World* (2006, p. 6) students who take dual-credit or advanced placement courses, which give both high school and college credit, are twice as likely to attend and graduate from college in four years, than those students who do not. Additionally, ACT (2005, p. 12) found that students who take advanced courses beyond the core curriculum are far

more likely to be successful in college than those who did not. In mathematics, 74 percent of students who took Trigonometry and Calculus met the benchmark for College algebra as compared with only 13 percent who had only Geometry and two years of Algebra. In science, 19 percent of students who took General Science, Biology, and Chemistry met the benchmark for College Biology while 45 percent of students who took Biology, Chemistry, and Physics met the benchmark.

### Implementation in Texas

#### ***A. Assure that all levels align with one another and that high school exit is equivalent to college entrance and provides necessary workforce skills***

Governor Rick Perry issued Executive Order RP53 in December 2005, directing the Texas Education Agency (TEA) and the Texas Higher Education Coordinating Board (THECB) to work together to enhance college readiness standards and programs for Texas' public schools. Citing the number of Texas high school graduates requiring remedial programs in college, the need for a strong foundation in science, technology, engineering, and mathematics, and the need for an increase of college graduates, Governor Perry directed both education agencies to create:

- science, technology, engineering and mathematics academies throughout the state;
- a system of college readiness indicators;
- an electronic academic records system to facilitate the transfer of transcripts between school districts, and between school districts and institutions of higher education;
- a series of voluntary end-of-course assessments in science, mathematics, and other subjects to measure student performance;
- a pilot financial assistance program for economically disadvantaged students taking college entrance examinations; and
- summer residential programs at Texas institutions of higher education for gifted and talented high school students to provide enhanced learning opportunities.

Two initiatives are already being implemented from this Executive Order. The first initiative is the Texas – Science, Technology, Engineering, and Math (T-STEM) Academies. School districts must submit Requests for Applications to Texas Education Agency for approval to open a T-STEM Academy either in 2006 or 2007. There will be 15 academies open by 2007, and a total of 35 open by 2011. Each academy can enroll only 100 students per grade level and students will be required to take four years of both mathematics and science, as well as participate in extra-curricular activities and an internship or project in areas related to science, technology, engineering or math. When all 35 academies are in operation, they will graduate approximately 3,500 students per year. The second initiative is the development of college readiness standards. The Texas Education Agency and the Texas Higher Education Coordinating Board are working together to identify the academic standards associated with student success in college. The standards, once identified, will be the basis for aligning secondary and higher education curriculum and assessments.

Another notable initiative is the Texas High School Project. This is a \$261 million public-private initiative designed to increase graduation and college enrollment rates in every Texas community. Financially supported by the Bill and Melinda Gates Foundation, the Michael and Susan Dell Foundation, the Wallace Foundation, and others, the project is dedicated to ensure that all Texas students leave high school prepared for college and career success.

In addition to these initiatives, two activities of particular significance are occurring in Texas. The first is that Texas secondary schools are required to provide all at-risk students with personalized graduation plans. These plans accelerate students' progress toward graduation, and the schools must provide a counselor or teacher to work with each student who performed poorly on the Texas Assessment of Knowledge and Skills test to develop the plan. The plan must identify educational goals for the student, include diagnostic, monitoring and intervention information, address parent participation, and provide innovative methods to promote the student's advancement.

The second activity of key significance is a curriculum redesign project. In the early 1990s the Charles A. Dana Center at the University of Texas was engaged by the Texas Education Agency to lead a complete mathematics curricula redesign project. The initial student cohort to take the revised math curriculum, in the 1993-94 school year, was in the first grade level. In developing the curriculum content, the Dana Center used advisory groups from all over the state representing both K-12 mathematics experts as well as higher education representatives. The revision was foremost a content revision, standards-based, using a problem-solving approach and developing new instructional strategies. Each year another grade level revision was added, until grades one through 12 had been revised. Results to date have shown promising improvement, particularly among minority students, in elementary and middle schools. In the 2005 National Assessment of Educational Progress (NAEP), Texas fourth graders ranked high among the states in mathematics. Nationally, African American students ranked second, Hispanic students ranked second, and white students ranked first. Eighth graders also did well in the 2005 NAEP mathematics test, with African-American students ranked third, Hispanic students ranked second and white students ranked third. NAEP results are not available at this time for 2005 high school seniors, so it remains to be seen if high school students are making similar gains. A curriculum revision is also currently underway in science.

***B. Increase graduation requirements, particularly in math and science***

Texas is one of a very few states that required three years of mathematics, which included Algebra II in its Recommended High School Program (RHSP), as approved by the Legislature in 2001 in House Bill 1144. A student is automatically enrolled in the RHSP unless their parents explicitly choose another curriculum, and receives counselor approval. The 79<sup>th</sup> Legislature, 3<sup>rd</sup> Called Session, passed House Bill 1, which includes a new standard for graduation requirements and requires four years of English, mathematics, science and social studies. While more rigorous requirements will better prepare Texas' high school graduates for entry into higher education or the workplace, it may also result in an increased drop-out rate. According to the *Texas Index 2005* (September 2005, p. 18), Texas' high school diploma rate has remained below 80 percent for the past five years, being 78.3 percent in 2004. Therefore, of equal importance to student success will be future initiatives that focus on both curriculum content and delivery process, thereby addressing a potential increase in the drop-out rate.

***C. Advanced Placement (AP) and/or dual-credit courses are available to all students and encourage all students to take them***

Though many do, school districts in Texas have not been required to offer either Advanced Placement (AP) or dual-credit courses. According to the Texas Education Agency (TEA), 56.1 percent of high schools had students who took at least one Advanced Placement (AP) examination. According to the Texas Higher Education Coordinating Board (THECB), 65.2 percent of high schools offer dual-credit courses. Dual-credit courses require an articulation agreement between the district and a college or university and are taught by college or university



faculty, or by qualified high school instructors. The 79<sup>th</sup> Legislature, 3<sup>rd</sup> Called Session, passed in House Bill 1 a requirement that all school districts in the state offer at a minimum, 12 semester credit hours of college credit courses (4 courses) by the fall of the 2008 school year. When dual-credit courses are offered to all high school students, research indicates that Texas will have more students entering and graduating from institutions of higher education when this legislation is fully implemented.

**2. Assure that all levels of the P-12 curriculum have rigorous courses taught by qualified teachers**

- A. Test to assure that all pertinent knowledge and skills are mastered before students move to the next level or course
- B. Offer support and additional instruction to all low-performing students

According to the Gates report *The Silent Epidemic* (March 2006) and others, it is essential that the content of each course and the knowledge and skills contained in the curricula are taught by qualified teachers in a rigorous manner everywhere in the state. If students who do not master the knowledge and skills at their level progress to the next course or level, they are more likely to drop out of school at some point. That same report stated (March 2006, p. iii) that 45 percent of school dropouts interviewed reported that they started high school poorly prepared by their earlier schooling. Other reasons given by students for dropping out were that classes were not interesting, they were not motivated to work hard, or they were not challenged in school. The most academically challenged students were the most likely to report that their schools were not doing enough to help them and express doubts that they would have worked harder. Assuming that curriculum reform has aligned course sequences through the K-12 grade levels, it is essential that evaluative testing occur throughout the school year to reveal, at the soonest possible time, any student not grasping the concepts being taught.

Studies (ACT 2005, p. 25; National Education Summit on High Schools 2005, p. 10) stressed that with an expanded core curriculum and more rigorous courses, early intervention for students who are performing below grade level is essential. Once a student's assessment reveals a fundamental lack of understanding of concepts and knowledge being taught, that student should have immediate access to additional instruction by qualified teachers. Common to both studies were that this support should be offered at other times such as before or after school rather than taking the student away from daily class instruction and that both student and parent need to be involved and aware of the importance of the mastering of the subject matter at every level of school.

Implementation in Texas

***A. Test to assure that all pertinent knowledge and skills are mastered before students move to the next level or course***

In Texas, state-required testing is administered at every grade level beginning in the third grade, and students cannot progress to the next grade until the specified knowledge and skills are mastered and demonstrated. Texas was one of the first states to implement such a statewide testing system and to link test results to school promotion. There have been several reiterations of the test, with each version updating knowledge and skills tested, requiring more problem-solving skills, and being more challenging.

However, the high school exit examination, the Texas Assessment of Knowledge and Skills (TAKS), first administered in the 11<sup>th</sup> grade, does not appear to measure at the same level as college readiness. This is evidenced by the large percent of students that pass the exit exam, register for college, but are required to take remedial courses. The Texas Education Agency created College Readiness Standards in mathematics and English in 2005 from the TAKS test. High school seniors who score above the standard are not required to take remedial classes in math or English in state colleges and universities. As of the April 2005 TAKS test administration, 47% of the graduating class had met that standard. In response to Governor Perry's Executive Order PR53, and required by House Bill 1, 3<sup>rd</sup> Called Session of the Texas Legislature, the Texas Education Agency and the Higher Education Coordinating Board are to develop readiness standards and expectations that address what students must know and be able to do to succeed in entry-level courses in institutions of higher education. This task force will recommend how the public school curriculum can be aligned with the college readiness standards and to develop strategies for teaching these courses in the areas of English, language arts, mathematics, science, and social studies.

***B. Offer support and additional instruction to all low-performing students***

Texas requires all secondary schools to provide all at-risk students with personalized graduation plans (PGP). These are individualized instruction programs designed to accelerate students' progress. Campus principals must designate a counselor, teacher, or other appropriate individual to develop and administer a personalized graduation plan for each student in the sixth grade or above who performs below grade level on the TAKS or is not likely to graduate from high school. This PGP must identify educational goals for the student; include diagnostic, monitoring and intervention information and other evaluation strategies; provide an intensive instructional program; address parental participation and expectations for the student; and provide innovative methods to promote the student's advancement, such as flexible scheduling, alternative environments, online instruction, and other interventions to accelerate learning. (NGA, pp. 16-17) Were Texas to consider intensifying this effort at the eighth grade level, the high number of Texas students who drop out of school between middle school and high school might be reduced.

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| <p><b>3. College is accessible for all qualified students, regardless of financial circumstances</b></p> <ul style="list-style-type: none"><li>A. Provide financial support for all qualified low-income students</li><li>B. Provide additional financial support for students majoring in the needed fields of science, technology, engineering, and mathematics (STEM)</li><li>C. College awareness curriculum should be introduced in elementary schools and continue throughout the secondary school years with tenth through twelfth grades focusing on college entry and financial aid options</li></ul> |
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The premise of the American competitiveness issue is that Americans must achieve significantly better in secondary and higher education, so that they, as educated citizens, can contribute to new innovations, which in turn fuel a robust economy. Given this and the average drop-out rates in American high schools, more high school students must graduate and enter postsecondary education, particularly in the fields of science, technology, engineering, and mathematics, the fields leading to scientific innovation. Not only does America require more students graduating in these fields, but also a larger percentage of the graduates must enter graduate school to work on Master's and Doctoral degrees. To achieve these goals, a higher percentage of students must graduate from high school with the necessary course credits to enter these fields in college. The

referenced studies note that increasing the number of young people entering postsecondary education will require accessible funding for qualified low-income students and an aggressive college awareness campaign in public schools, beginning in elementary school and continuing through high school, which would address all students and parents on the path to graduation and focus on college planning, preparing for required entrance examinations, and financial planning.

Current studies recommend that a college awareness curricula needs to be a high priority for all public schools. Research suggests that nearly all elementary and middle school students want to go to college. But with nearly 30 percent of students not graduating from high school and many who do graduate not attending higher education, that reality is lost to far too many students.

### Implementation in Texas

#### ***A. Provide financial support for all qualified low-income students***

According to the *Texas Index* (September 2005, p. 19), college enrollment increased from 4.77 percent in 1998 to 5.22 percent in 2004, measured against the entire population. This percent has been rising each of the last seven years. In actual numbers, the college population has increased from 939,364 in 1998 to 1,173,109 in 2004, an increase of 24.88 percent. However, enrollment goals are not being met for the Hispanic population, the state's fastest growing population segment. Hispanic enrollment is growing at 18,188 per year, but an average annual increase of 23,520 is required to reach current goals.

Financial support for low-income students is available to Texas students through federal Pell Grants, privately financed grants, and state-funded programs. However, funding is limited in these programs and many private grants are very specific as to the institution and area of study of the prospective grantee. The difficulty for students and parents is in locating these financial aid programs and applying for them. Most school districts have school counselors that assist students with this process. In Texas, the personalized graduation plans (PGP) offer help in college preparation, but the program addresses only those who score poorly on the TAKS test. Low-income students who pass the TAKS tests would not have access to this personalized service. If these services were expanded in Texas' high school to include all students on a proactive basis, it is possible that a higher percentage of high school students might graduate and enter a postsecondary institution.

In Texas, the TEXAS (Toward Excellence and Access) Grant Program provides financial incentive to low-income Texas students who complete the Recommended High School Program (RHSP). These grants provide financial aid in the amount of tuition and fees at Texas public universities. Students can receive awards for up to 150 semester hours for six years if they maintain a 2.5 GPA. About 64,000 students received a TEXAS Grant during the 2004-2005 academic year.

#### ***B. Provide additional financial support for students majoring in the needed fields of science, technology, engineering, and mathematics (STEM)***

The T-STEM Academies will begin opening in the 2006-2007 school year, with more following in the next school year. These academies will produce highly qualified students who enter college and major in the fields of science, technology, engineering, and mathematics. There are several proposals included in the President's American Competitiveness Initiative that will, if enacted, create new federal grants for higher education. The Academic Competitiveness grants would provide increased funds for low-income students who take a rigorous academic program in

high school. SMART grants would go to college juniors and seniors studying math, science, or critical-need foreign languages.

***C. College awareness curriculum should be introduced in elementary schools and continue throughout the secondary school years with tenth through twelfth grades focusing on college entry and financial aid options***

In Texas, college awareness curriculum is largely determined by each local school district. The research cited in this report suggests that an aggressive effort is required, beginning in elementary school and continuing through high school, to educate students on job content, career opportunities and earnings potential. Students also need to be made aware of the training requirements of various careers, whether it is an associate degree, a baccalaureate degree, or a doctoral degree, and the earnings associated with each. Research suggests that the college awareness curricula intensify in the 8<sup>th</sup> grade, because the largest student dropout occurs between the 8<sup>th</sup> and 9<sup>th</sup> grades. Once students enroll in high school, they are far more likely to graduate. Similarly, by the 10<sup>th</sup> and 11<sup>th</sup> grades, the college awareness curricula would focus on postsecondary opportunities, as well as preparation for college entrance examinations and financial aid.

**Recommendations on Skills and Training of the Workforce**

**1. Assure that all public school students have career awareness training from the elementary level through high school**

- A. Career awareness curriculum should focus on high-growth jobs and should stress levels of preparation for the various careers, the correlation between education and earning capacity, individual career management throughout the working life, lifelong learning, and access to skills upgrading through community and technical colleges and university offerings

Studies report that while almost all of elementary and middle school students plan to go to college, most have very little knowledge of college majors, career opportunities, or what they would need to do to get into college. Along with the college awareness curriculum discussed in the previous section, it was recommended that a career awareness campaign be offered concurrently with the college awareness curriculum. Recent research (ACT 2005, p. 6) indicates that there is a disconnect between what young people aspire to, and an understanding of the education and training required to reach their goals.

Various business associations, particularly those that are experiencing skilled employee shortages like the National Association of Manufacturers, are realizing that they must become more engaged with public education, working with educators in shaping curriculum, holding career fairs, and sponsoring internships. Career awareness needs to include local employers and must make a strong connection for the student that postsecondary education is critical to get a high-paying job. In the next twenty to thirty years, it is estimated that 70 percent of the fastest growing jobs will require at least some college education, and 40 percent will require an associate degree.

Recent studies report that the average job in the future may last only three to five years. Students need to be aware of programs in community colleges, technical schools, and four-year universities that are available for retooling and increasing their skills. Life-long learning will soon become a fact of life as people move from one career to another. Technology is changing so

rapidly that even if a worker stays with the same company, knowledge and skills will have to be constantly updated to keep up with changes in the workplace.

### Implementation in Texas

- A. Career awareness curriculum should focus on high-growth jobs and should stress levels of preparation from the various careers, the correlation between education and earning capacity, individual career management throughout the working life, lifelong learning, and access to skills upgrading through community and technical colleges and university offerings**

While current studies (NAM 2005, p. 23) suggest that career awareness needs to be a high priority for public schools, starting at an early age in elementary schools, discussions with staff at the Texas Education Agency did not reveal any statewide initiative in support of this recommendation. Career awareness curriculum is currently up to local school districts. For Texas to implement a statewide program in its public schools, efforts should be made to collaborate with local employers, local postsecondary educators, career counselors, and other groups such as chamber of commerce and industry associations. The focus of the initiative would be on high-growth, high-paying careers with emphasis on education and training requirements for the various jobs.

Texas has a set of unique resources that can assist students to explore careers. The Labor Market and Career Information unit of the Texas Workforce Commission works closely with school districts around the state and offers both online and downloadable programs to help students learn more about career choices. Two of the programs offered are OSCAR and Reality Check. OSCAR (Occupation and Skills Computer-Assisted Researcher) helps student decide what is important in a job by having them rank different aspects of work. It also directs the students to career information in the types of jobs that they might prefer. Reality Check is an online tool that has students create a budget by listing amounts for housing, food, utilities, clothing, entertainment, etc. It then directs them to careers which would “pay” for their budget and gives occupational information and education required, for various careers.

**2. Secondary education, community and technical colleges, and four-year universities should develop curricula that stress transferable skill sets and offer skills-based, industry-driven portable certifications**

- A. Students should be prepared for a lifetime of rapid technological change and various jobs and careers during their working life. Students must acquire skill sets that are transferable between jobs and occupations and have the capacity to learn and adjust to new skills sets
- B. American industry must collaborate with higher education to develop curricula that will create portable certification programs to graduate students possessing the skills necessary to succeed in the high-performance workplace

Recent studies indicate that high-performance workplaces require employees that have strong, basic skill sets that can be molded by the employer to their individual needs. Employers indicate that above all, they are seeking employees who are trainable. Quoted in an Education Commission to the States issue brief (January 2005, p. 1), a recent RAND report, *The 21<sup>st</sup> Century at Work*, stated that “rapid technological change and increased international competition place the spotlight on the skills and preparation of the workforce, particularly the ability to adapt

to changing technologies and shifting product demand. The growing importance of knowledge-based work favors workers with the skills of abstract reasoning, problem solving, communication and collaboration.”

The National Association of Manufacturers reported (2005, p. 1) that the second most common driver of success was new-product innovation, which links back to employee quality and performance. They also reported (2005, p. 8) that 73 percent of employers provide training to employees because it was a business necessity. “To have a high performance workforce, companies must create a culture of high performance workplace, and training is integral to meeting this objective.”

Steve Gunderson, in his testimony before Congress (April 2005, p. 5) stated that America must prepare its workforce for the 21<sup>st</sup> Century. It requires a direct relationship between academics and career skills. High school and college programs must promote flexibility and mobility in the workforce and create a nation of life-long learners. He also stated that America must move toward employer-recognized, industry-based certificates that would be recognized nationally.

### Implementation in Texas

***A. Students should be prepared for a lifetime of rapid technological change and various jobs and careers during their working life. Students must acquire skill sets that are transferable between jobs and occupations and have the capacity to learn and adjust to new skills sets***

Nearly all the studies and reports stressed that workers in the 21<sup>st</sup> century need to have skill sets that contain strong academic foundations in math, science, technology, and English, good communication skills, and the ability to work in groups to problem solve. If employers can hire workers with these transferable skills, businesses can train them to do the specific tasks required by the businesses’ work processes.

Texas has been working for more than a decade to improve secondary education by testing students for proficiencies, improving curriculum, making the graduation requirements more demanding, and courses more rigorous. With the movement toward a 4+4+4+4 graduation standard, requiring four years of English, mathematics, science and social science, Texas will lead the nation in the strength of graduation requirements. Texas is moving more rapidly than perhaps any other state to create a workforce with the skills necessary to succeed both in college and the workplace. The work that the Texas Education Agency and the Texas Higher Education Coordinating Board are doing to respond to Governor Perry’s Executive Order RP53, which requires aligning graduation standards to college entrance and the creation the T-STEM Academies directly addresses the need for transferable skill sets. The Texas High School Initiatives also addresses this need.

***B. American industry must collaborate with higher education to develop curricula that will create portable certification programs to graduate students possessing the skills necessary to succeed in the high-performance workplace***

There are examples in Texas of collaborative efforts between industry and educators creating industry-based certifications. In the Gulf Coast area, the Gulf Coast Process Technology Alliance (GCPTA), a regional alliance made up of industry representatives and education providers, is responsible for developing, improving and maintaining the standardized two-year curriculum for Process Technology. In collaboration with the Center for the Advancement of Process Technology at the College of the Mainland, GCPTA developed an associate degree in process

technology and is currently working on an exit exam that could be the basis of an industry-based certification that would be in addition to the college-awarded associate degree. This model is being replicated by the Industrial Instrumentation and Controls Technology Alliance for instrumentation technicians, but at this time does not have an assessment. A national example that is being considered in Texas is adopting the Manufacturing Skill Standards Council's manufacturing curriculum and certification. If more such collaborative efforts between industry groups and Texas' community colleges were to take place, curriculum could be developed and put in place that would train workers for the various industries with the knowledge and skills that these employers require. The development of such competency standards and industry-based certifications is a critical step for Texas' community colleges to become a relevant trainer and educator for Texas industries.

The National Science Foundation is an independent federal agency whose mission is to provide support for all fields of fundamental science and engineering. The Foundation is tasked with keeping the United States at the leading edge of discovery in all areas of science. In an effort to promote excellence in science and engineering education in high schools, community colleges, and four-year universities, and collaborative efforts between industry and educational institutions, the National Science Foundation awards three-year grants for Advanced Technical Education (ATE). In addition, NSF sponsors Advanced Technical Education Centers, which serve as national or regional resources that provide leadership and models for other projects. These centers are also clearinghouses for educational materials and methods. With 30 centers across the U.S., Texas has two, one located at the College of the Mainland in Texas City and the other at Collin County Community College in McKinney. In addition, Texas has 14 active ATE awards in Community Colleges and four-year universities across the state.

In addition, President Bush proposed the Community-Based Job Training Grants in his 2004 State of the Union address, and the Department of Labor awarded \$125 million in grants in October 2005. The purpose of these grants is to provide workers with training to access good paying jobs in high growth industries such as health care, construction, advanced manufacturing, and energy. Grants are awarded through community colleges as the fiscal and training agent. Seventy grants were awarded in 40 states, with Texas receiving eight.

**3. Public schools must graduate students who are work-ready and possess the skills to succeed in the American high-performance workplace**

- A. High schools must stress basic employability skills such as attendance, timeliness and work ethic, as well as strong reading, math, computer, and communication skills

The National Association of Manufacturers (NAM) *2005 Skills Gap Report* (2005, p. 7) reported that "basic employability skills" were the most frequently named skills that their employees lacked. NAM defines basic employability skills as good attendance, timeliness, and work ethic. This skill-group was tied with employees lacking technical skills. Another skill that is important to the high-performance workplace is problem-solving ability, or the ability to use knowledge and skills to solve problems in production. Companies also report that they require employees with strong reading, writing, and communication skills. For American companies to remain competitive in the global marketplace, employees must have the ability to create new products, processes, or develop means to improve current products. After years of maintaining a huge lead in patents, American companies are currently only receiving a little over half of patents granted. Many states have a dual-graduation requirement, one for college-bound youth and another for those preparing to enter the workforce. According to ACT (2005, p. *iii*) college readiness now is

the same as workplace readiness. “While not every student plans to attend college after high school, many of the jobs now being created in a highly technology-based economy require abilities equivalent of the first-year college student.”

### Implementation in Texas

#### ***A. High schools must stress basic employability skills such as attendance, timeliness and work ethic, as well as strong reading, math, computer, and communication skills***

Texas is one of a very few states that required three years of mathematics, which included Algebra II in its Recommended High School Program (RHSP), as approved by the Legislature in 2001 in House Bill 1144. Given the change made by the 79<sup>th</sup> Legislature, 3<sup>rd</sup> Called Session and previously discussed in this report, a new standard for graduation requiring four years of English, mathematics, and science, academic competencies for high school graduates will be increased, thereby impacting graduates level of work readiness. However, this increase will not necessarily address the development of employability skills.

There are two high school program areas that in some way, address the issue of employability skills: Tech-Prep and Career and Technology Education (CATE). Anecdotal data suggest that many students in Texas’ public schools who are exploring options of career pathways are registered in CATE or Tech-Prep sequences. According to *Evaluation 2005* (Texas Workforce Investment Council, p. 16), 160,674 students, or 38 percent of all secondary students, were enrolled in a Tech-Prep sequence. These programs, which have articulation agreements between school districts and community colleges, are designed to be a four-year program with two years in high school and two years in community college, and an Associates degree. Students in Tech-Prep can enter their field directly after completing high school, but are encouraged to register and complete the community college sequence. These programs are collaborative efforts with local employers and many provide internships and on-the-job training for students enrolled with local employers. Tech-Prep sequences are specifically designed to promote job readiness skills as well as feature curriculum that directly applies to the area of the major. If students choose to pursue further education beyond the associates degree, their course credits in community college count toward the baccalaureate programs in the same field.

### **Concluding Comments**

American competitiveness and world economic leadership has been predominant since World War II, based firmly on the American educational system and innovation. Students are not graduating from college in sufficient numbers to fill the high-skilled jobs of American employers and only a small percentage are graduating from high school with the prerequisites to enter the science, technology, engineering, and math fields in college.

Texas has recognized this crisis and is working to strengthen its education system. Governor Perry’s Executive Order RP53 set in motion an action plan to address and strengthen Texas’ education system through the identification of specific college readiness standards. The T-STEM Academies and the Texas High School Project hold the promise that more Texas high school graduates will be eligible to attend college. In addition, with the passage of House Bill 1 in the 3<sup>rd</sup> Called Session, the 79<sup>th</sup> Legislature instituted a graduation requirement that is second to none in the U.S. Additionally, the requirement for all school districts to offer dual-credit courses to its high school students increases the potential for students to enter and succeed in postsecondary education. Research indicates that students who take advantage of these courses giving them college credits are twice as likely to enter and graduate from college in four years.



While many of these initiatives are steering Texas in a positive direction, it remains to be seen how they will affect Texas' students in the coming years. Programs will need to be put in place offering early intervention for students not performing at grade level, and more attention will need to be given to address the graduation rates, especially of Hispanic and African American students. With the increase in graduation requirements, many students will need additional help to be successful in these courses so that they will not be discouraged and drop out of school. Texas' students will need strong college and career awareness programs beginning in elementary school, and more incentives to graduate from high school, enter college, and graduate from college. The state is making significant strides in educational reform, leading the nation in many areas. The success of these initiatives and programs is imperative if Texas is to lead the nation in innovation and competitiveness into the new century.

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