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**Prepared High School Students Needed  
to Head off Looming Skill  
and Labor Shortage**

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**Center for State Scholars  
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## Executive Summary

While 40 of the 50 fastest growing occupations in the nation now require at least some education after high school, seven out of 10 students now graduate from high school without completing the courses they will need to succeed in college or in the workplace. This trend is leading many employers to report difficulties in finding qualified employees. By 2010, the nation's workforce is expected to face a shortage of more than 12 million college-educated workers.

To meet the growing demand for highly qualified workers, while better preparing students to compete in a job market that will require strong academic credentials and technical skills, the U.S. must increase the percentage of high school graduates completing a rigorous course of study that includes: three credits of math through at least Algebra 2; three credits of basic lab science, including physics; four credits of English; 3.5 credits of social studies; and two credits of a language other than English.

The U.S. Department of Education has shown conclusively that such rigorous coursework better equips high school graduates to advance to higher education, complete a degree, succeed at training for work or the military, or resume education at a later date. African-Americans and Latinos are more likely to complete a bachelor's degree if they have had a rigorous high school course of study, with African-American degree completion rising from 45 to 73 percent and Latino completion from 61 to 79 percent. Challenging coursework also mitigates low socioeconomic status. High school coursework also affects future earnings, with students completing rigorous high school courses enjoying a 13.1 percent wage advantage nine years after graduation. Adults with only a high school diploma are twice as likely to be unemployed as those with a bachelor's degree.

A business-led initiative in Texas showed that a majority of students — not just three out of 10 — is capable of completing rigorous coursework. The Texas Scholars program challenged high school students to master a set of academically rigorous courses by appealing to their self-interest. Texas Scholars was particularly effective because employers took a lead role in describing the opportunities that await young people who work hard and complete rigorous courses in high school, making it clear that coursework matters to future academic and career success. Armed with facts and a roadmap, many students enrolled in tougher courses, sometimes despite the apprehensions of parents and teachers. When students successfully completed challenging courses, it bred higher expectations among peers, generating greater demand for high-level courses and the teachers who can teach them. Texas Scholars also challenged adults' assumptions about who is "college material," altering the very culture of participating schools and their surrounding communities.

As students' expectations for themselves increased, they demanded more from the education system. Business leaders helped convert these new pressures into sustainable high school improvement, including:

- Aligning state education policy with rigorous academic course completion;
- Determining what qualifies as "Scholars" coursework;
- Defining course content standards;

- Developing state and local data systems to capture Scholars measures;
- Creating academic supports to ensure student success; and
- Recruiting high school teachers who can instruct students in higher-level knowledge and skills.

The success of the Texas Scholars program in changing course completion patterns and aligning state education policy prompted President George Bush and U.S. Secretary of Education Rod Paige to sponsor the national State Scholars Initiative (SSI) in summer 2002.

To date, the national Center for State Scholars has provided assistance and grants of up to \$300,000 to 12 statewide business groups to launch SSI in their respective states. To implement the Initiative, states must submit an application to the Center that describes their readiness in four criteria: (1) high school reform must be a priority for decision leaders; (2) a viable state business-education coalition must exist to lead the Initiative; (3) key in-state corporations must serve as “flagship” sponsors; and (4) the state policy structure must be amenable to alignment with rigorous Scholars course completion.

At the community level, SSI consists of three complementary activities: explaining the impact a Scholars course of study has on students’ future options; supporting students in becoming State Scholars; and honoring each high school senior completing the Scholars course of study.

At the district and state level, SSI also includes strategies to sustain high school improvement, including: encouraging Scholars to apply for employment at local businesses; developing or improving student tracking software; adopting the Scholars course of study as a criterion for free tuition at two-year community and technical colleges, and for preferential or automatic admission to public colleges and universities; establishing the course of study as a statewide default graduation plan; and instituting large-scale, merit-based financial aid based on completion of a rigorous course of study.

If past patterns hold true, students who graduate after completing the Scholars course of study will be twice as likely to be college-ready as their peers completing minimum graduation plans, more likely to complete an associate’s or bachelor’s degree, and able to earn more in the years after high school.

The experience in Texas and Arkansas has shown that the more the State Scholars concept spreads and businesses participate, the more credibility and esteem a student’s designation as a State Scholar will command. The result will be a high level of awareness of the importance of academic achievement among students, and a thorough understanding within the business and education communities of the policies and strategies that bring about a culture of achievement in American high schools.

## Prepared High School Students Needed to Head off Looming Skill and Labor Shortage

The U.S. Bureau of Labor Statistics reports that 40 of the top 50 fastest growing occupations in the nation now require at least some education after high school.<sup>1</sup> By 2010, employment in occupations requiring at least a bachelor's degree is expected to grow 21.6 percent, while jobs requiring a minimum of an associate's degree are projected to rise an astounding 32 percent.

Contrast the employment outlook with a U.S. Department of Education study that says seven out of 10 students in the country are graduating from high school today without completing the courses they ultimately will need in order to succeed in college or in the workplace.<sup>2</sup>

Many employers, in fact, already report having trouble finding qualified employees. Eighty percent of the businesses surveyed by the National Association of Manufacturers indicated that they are facing a "moderate to serious" shortage of qualified job candidates.<sup>3</sup> Fifty-nine percent of those businesses reported that recent hires lack basic employment skills. More than a quarter cited inadequate math skills, while a third complained that job candidates exhibit poor reading and writing skills.

The societal effects of poor preparation in high school are well-documented. Economically disadvantaged students are disproportionately unprepared for college or the working world. Non-white students are half as likely to complete a bachelor's degree as their white counterparts.<sup>4</sup> African-American and Latino high school students are respectively 19 percent and 38 percent less likely than their white and Asian peers to complete the gateway course, Algebra 2.<sup>5</sup> Racial/ethnic groups with today's lowest college enrollment and graduation rates will constitute a larger proportion of the U.S. population in future years.

All of this foreshadows a shortage of workers who are qualified to handle the responsibilities that will accompany most jobs in what is fast becoming a knowledge-based economy. Estimates are that by the end of this decade, the nation's workforce will face a shortage of more than 12 million college-educated workers.<sup>6</sup>

Merely enrolling more people in college won't solve the problem because almost half of the students entering college today are ill-prepared for the demands of higher education. Before they can enroll in classes that apply to their degrees, they require remedial courses that are costly in both time and money. Moreover, remedial college students are much less likely to earn a degree than other students.<sup>7</sup>

So, while businesses continue to eliminate jobs that require lower-level skills — replacing them

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<sup>1</sup> U.S. Department of Labor, Bureau of Labor Statistics, *Occupation Outlook Survey 2002-03*.

<sup>2</sup> U.S. Department of Education, *NCES Digest of Education Statistics 2002*, Table 142.

<sup>3</sup> National Association of Manufacturers, "Skills Gap 2001."

<sup>4</sup> U.S. Department of Education, National Center for Education Statistics, *The Condition of Education 2002*.

<sup>5</sup> Council of Chief State School Officers, *State Indicators of Science and Mathematics Education, 2001*.

<sup>6</sup> Bureau of Labor Statistics, U.S. Department of Labor, "Occupational Employment Projections to 2010," *Monthly Labor Review*, November 2001.

<sup>7</sup> Clifford Adelman, *Answers in the Tool Box: Academic Intensity, Attendance Patterns, and Bachelor's Degree Attainment*, Washington, DC: U.S. Department of Education, 1999.

with positions demanding stronger academic credentials and higher technical skills or displacing them entirely with either technology or competitive offshore labor — our nation's schools are turning out graduates who lack the qualifications and work ethic to succeed in a more tumultuous job market.

This is not exclusively a business dilemma. It is an issue that threatens to undermine the very fabric of our society. Students who graduate from high school without completing rigorous academic coursework are missing a crucial window of opportunity to obtain the academic foundation they will need to function in college or in the workplace and to participate fully in a knowledge economy. That academic foundation is vital currency in today's and tomorrow's job market. Without it, they can look forward only to more limited career prospects, restricted earnings potential and diminished quality of life.

## Why A Rigorous Course of Study?

To meet the industry's growing demand for highly qualified workers, while better preparing today's students to compete — and succeed — in a job market that increasingly will require broader knowledge and high-level technical skills, the United States must increase the percentage of high school graduates who complete a defined sequence of rigorous academic courses in math, lab sciences, English, social studies, and languages other than English.

Why a rigorous course of study? When the U.S. Department of Education researchers examined the records of 13,000 students from 10th grade in 1980 to age 30 in 1993, they found that course of study was a far more accurate predictor of student success than grades, national standardized test scores, or class rank, particularly among minority students.<sup>8</sup> Students who complete a rigorous course of study in high school score on average 2.6 points higher on the ACT<sup>9</sup> and 102 points higher on the SAT.<sup>10</sup> Students who complete rigorous coursework are better equipped to advance to higher education, complete a degree, succeed in the workplace or in military training programs, or resume their education in preparation for a career change at a later date.

### ***What constitutes a rigorous course of study?***

Based on three long-term, longitudinal studies of students conducted by the U.S. Department of Education,<sup>11</sup> the Center for State Scholars defines a course of study as rigorous if it includes at a minimum:

- three credits of math (Algebra 1, geometry, Algebra 2)
- three credits of basic lab science (biology, chemistry, physics)
- four credits of English
- three and one-half credits of social studies (chosen from U.S. and world history, geography, economics and government)
- two credits of the same language other than English

Why focus on these five subject areas? Employers and college professors alike want high school

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<sup>8</sup> Adelman, 1999.

<sup>9</sup> ACT, *High School Profile Report*, 2002.

<sup>10</sup> College Board 2000, 2000 Profile of College-bound Seniors: Texas, Princeton, N.J.

<sup>11</sup> Adelman, 1999.

graduates who can read, write, and present ideas; decode informational and technical text; frame, analyze, and solve problems; interpret data and use it to project results; use scientific method; and communicate with counterparts from other cultures and whose first language is not English. These same skills determine who advances in an organization. Following are some specific benefits of mastering academic coursework.

**Math:** The strongest predictor of a student's ability to earn a degree is the level of mathematics completed. Completing a mathematics course beyond Algebra 2 more than doubles the likelihood that a student will complete a bachelor's degree.<sup>12</sup> Nearly a quarter of all students who complete geometry earn a bachelor's degree, while 40 percent of students who complete a second year of algebra earn a bachelor's degree. Students who complete trigonometry go on to earn a bachelor's degree two-thirds of the time. According to one study, each math class completed beyond Algebra 1 results in a five percent increase in wages, regardless of degree completion and this premium increases as the individual ages.<sup>13</sup>

High school graduates can no longer be guaranteed success in good jobs — even those historically labeled “unskilled” — without a strong command of math, and the ability to apply that knowledge in new situations. Research conducted by the American Diploma Project<sup>14</sup> reveals that whether high school graduates choose to enter college or a skilled trade when they graduate, the mathematics knowledge and skills required is much the same. Successful electricians, health care technicians, and machine operators, to name a few, all need to know how to calculate geometric measurements, apply the Pythagorean Theorem and trigonometric functions to solve problems, and create mathematical models of problems and solve them. ADP's forthcoming benchmarks and samples from the workplace and college classrooms will help supply answers to the perennial question from students, “Why do I need to learn this stuff?”

**Science:** As a result of advances made in the 20th century, scientists better understand the interplay between biology, chemistry, and physics. Today, biology is best understood by those students with a grasp of organic chemistry. Chemistry is based on physics. Students who complete all three courses acquire the fundamental knowledge that is required in many of the fastest growing careers, ranging from engineering, health care, and environmental science to the electrical and heating/ventilation/air conditioning fields.

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<sup>12</sup> Laura Perna and Mavin Titus, “Understanding difference in the choice of college attended,” April 2003.

<sup>13</sup> Deena Ackerman, “Do the Math: High School Mathematics Courses and the Earnings of High School Graduates, unpublished dissertation, University of Wisconsin, Madison, 2001.

<sup>14</sup> American Diploma Project, Pending Report, February 2004.

A U.S. Department of Education longitudinal study measured increases in student scientific knowledge between the eighth and 12th grades. Students who took physics increased their science proficiency at rates two-thirds higher than those who took neither physics nor chemistry, and at rates 30 percent higher than those who stopped at chemistry.<sup>17</sup> This suggests that physics solidifies students' understanding of the other two laboratory sciences.

Knowledge of other natural sciences is based on our knowledge of these three core sciences. A student of earth science, for example, cannot fully understand wave action along a beach unless the phenomenon of waves has been covered in physics. The weathering of rocks and their crystalline structure cannot be understood at anything but the most rudimentary level without a foundation in chemistry. Students are better served by treating such sciences such as earth science as capstone experiences in the senior year of high school, enabling them to integrate what they learn in the basic sciences.

**English:** Thirty-two percent of manufacturers are dissatisfied with the reading and writing skills of their hourly workforce.<sup>18</sup> A 1999 American Management Association Survey reported that one-third of employees tested for literacy did not pass.<sup>19</sup> Employers need workers who can:

- Choose words precisely to enhance communication
- Comprehend and communicate quantitative, technical, and mathematical information
- Demonstrate control of standard English
- Plan writing by taking notes and researching
- Organize ideas in writing, as well as revise writing to develop ideas more clearly
- Cite sources
- Use basic effective desktop publishing to present information

Literacy is essential to employees' workplace safety and work rule compliance. What is more, it drives an organization's critical thinking and decision-making abilities.

Literacy also has a direct impact on an individual's ability to qualify for a job that pays enough to support a family. A high level of literacy virtually erases income inequities between demographic and socioeconomic groups.<sup>21</sup> For these reasons, the Scholars course of study requires four years of grammar and English-language literature, undiluted by derivative courses such as "applied technical writing."

**Social Studies:** As the world grows smaller through increased communications and fewer barriers to travel and trade, students must acquire a foundation of U.S. and world geography, history, government, and economics to appreciate our own democratic and free enterprise system and respond intelligently to emerging trends.

Students who complete coursework in civics or American government are much more likely to say they are personally accountable for making society better.<sup>22</sup> They express responsibility for voting, obeying the law, paying attention to government, and contacting elected officials on

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<sup>18</sup> Timothy Madigan, "Science Proficiency and Course Taking in High School" NCES 97-838, March 1997.

<sup>18</sup> National Association of Manufacturers, 2001.

<sup>19</sup> American Management Association, 1999.

<sup>21</sup> Andrew Sum, "Literacy in the Labor Force," NCES, September 1999.

<sup>22</sup> Karl T. Kurtz, Alan Rosenthal, and Cliff Zukin, *Citizenship: A challenge for all generations*, National Conference of State Legislatures, 2003.

issues to a much greater degree than students who have not completed civics classes.<sup>23</sup> Americans between 15 and 26 years of age born after 1976 are two to three times more likely to say that they are engaged in political activities if they have taken a civics or American government class than those who have not.<sup>24</sup> Students who have learned basic economic concepts such as commerce and taxation are better positioned to study history, as well as to adopt personal financial strategies that safeguard their interests.<sup>25</sup>

**Foreign Languages:** Students who study two years of a language other than English score an average of 60 points higher on the SAT I verbal test and 48 points higher on the math than students who do not complete two years of a language.<sup>26</sup> Students who go on to study four years of a language in high school gain, on average, 149 and 150 points on the verbal and math tests, respectively.

Research also shows that while young children learn foreign languages rapidly, they lose ability in those languages quickly and permanently unless they continue to use the language.<sup>27</sup> In contrast, students who learn a language during adolescence retain a good bit of knowledge and ability indefinitely.<sup>28</sup> A survey of 400 faculty and staff members from 20 research universities concluded that learning a language other than English helps students to perform well in English because it introduces them to a different, theoretical view of language that aids the study of English.<sup>29</sup> Studying a second language also gives students a window on another culture.

Careers where a second language is in demand include nursing, law enforcement, government and social services, and fire fighters, to name a few.

Finally, foreign language completion in high school is linked to higher wages after school. Two years of a language other than English raises wages by an average of four percent.<sup>30</sup> What is more, this wage advantage accrues to even those students who don't go on to higher education. For example, the U.S. Army pays a wage premium to enlisted soldiers who speak a second language.<sup>31</sup>

### ***Strong Link between Rigorous Coursework and Success***

According to the research,<sup>32</sup> there is a strong link between the courses completed in high school and degree completion in college. Students who complete Algebra 2, for example, earn a

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<sup>23</sup> Kurtz et al, 2003.

<sup>24</sup> Kurtz et al, 2003.

<sup>25</sup> Gary H. Stern, "The Importance of Economic and Financial Literacy: NCEE's Survey of the States," National Council on Economic Education, [http://www.ncee.net/news/story.php?story\\_id=37](http://www.ncee.net/news/story.php?story_id=37), 2003.

<sup>26</sup> College Board, 2002 College Bound Seniors, Table 3-3.

<sup>27</sup> Dorit Kaufman, "First Language Attrition: Cross-Linguistic Restructuring in Children's Verbs," presented at the American Association of Applied Linguistics conference, Seattle, 2002.

<sup>28</sup> Harry Bahrck, "Fifty Years of Second Language Attrition: Implications for Programmatic Research," *Modern Language Journal* (68), pp. 105-118.

<sup>29</sup> Standards for Success, a project of the Association of American Universities and The Pew Charitable Trusts, "Understanding University Success, University of Oregon, Center for Educational Policy Research," Eugene, Oregon, 2003.

<sup>30</sup> Joseph Altonji, "The Effects of High School Curriculum on Education and Labor Market Outcomes," *Journal of Human Resources*, summer 1995, p. 424.

<sup>31</sup> <http://www.military.com/Resources/ResourcesContent>.

<sup>32</sup> Adelman, 1999.

bachelor's degree nearly 40 percent of the time. In contrast, students who stop at geometry earn a bachelor's degree only 23 percent of the time.<sup>33</sup>

High school coursework also affects future earnings. Students who complete rigorous courses in high school enjoy, on average, a 13.1 percent wage advantage nine years after graduation, regardless of whether they attended college or not.<sup>34</sup>

Conversely, adults with just a high school diploma are twice as likely to be unemployed as those with a bachelor's degree.<sup>35</sup> They earn \$6,000 less per year than those with an associate's degree, and nearly \$20,000 less per year than those with a bachelor's degree.<sup>36</sup>

### ***Results of Rigorous Coursework Cut across Ethnic, Socioeconomic Lines***

The U.S. Department of Education studies also reveal that African-Americans and Latinos are more likely to complete a bachelor's degree if they have had a rigorous high school course of study, with African-American degree completion rising from 45 percent to 73 percent and Latino completion from 61 percent to 79 percent.<sup>37</sup> Rigorous academic coursework also benefits non-white students disproportionately. While white students show increased graduation rates of 10.4 percent if they complete a set of rigorous courses in high school, Latinos have an increased graduation rate of 18.5 percent and African-Americans 27.5 percent.<sup>38</sup>

Challenging coursework can help to mitigate low socioeconomic status (SES). Pell Grants, based on financial need, are awarded most often to students who come from economically disadvantaged households. Pell Grant recipients who complete a rigorous course of study are more likely to enter — and graduate from — college at similar rates as students who come from higher SES households. More than 85 percent of Pell Grant recipients who completed a rigorous high school course of study remained in college through the third year, compared to 83 percent of their non-Pell peers.<sup>39</sup>

Similarly, first-generation college-going students who completed a rigorous high school course of study had a comparable grade point average (GPA) at the conclusion of the third year of college to students whose parents had attended college. In addition, 86.3 percent of first-generation college-going students who completed rigorous coursework in high school remained in college and at the same institution through the third year, compared to 85.8 percent of students whose parents had college degrees.<sup>40</sup>

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<sup>33</sup> Adelman, 1999.

<sup>34</sup> Brian Zucker and Royal Dawson, "Credits and Attainment: Returns to Postsecondary Education Ten Years after High School," (NCES 2001-168), Table 21.

<sup>35</sup> U.S. Bureau of Labor Statistics, *Occupational Outlook Quarterly*, Fall 1999, "More education: Higher earnings, lower unemployment," 1998 data.

<sup>36</sup> Bureau of Labor Statistics and Bureau of the Census, Current Population Survey, Annual Demographic Survey March Supplement, "Educational Attainment - People 18 years old and over, by total money earnings in 2001," Washington, D.C., March 2002.

<sup>37</sup> Adelman, 1999.

<sup>38</sup> Adelman, 1999.

<sup>39</sup> Christina Wei and Laura Horn, Persistence and Attainment of Beginning Students with Pell Grants, NCES 2002-169, U.S. Department of Education, Washington, DC.

<sup>40</sup> Edward C. Warburton, Rosio Bugarin, and Anne-Marie Nuñez, "Bridging the Gap: Academic Preparation and Postsecondary Success of First-Generation Students," NCES 2001-153, U.S. Department of Education, Washington, DC.

### ***Proof That a Rigorous Course of Study Works***

The strong body of research showing the link between rigorous coursework and success in college or in the workplace is supported by a 15-year classroom-based awareness and motivation campaign conducted in local communities in Arkansas, Tennessee, Texas, and Virginia. Launched by Eastman Chemical Co., the precursor to the State Scholars Initiative demonstrated that challenging students to complete rigorous courses can achieve the desired results. Eastman's initiative grew most aggressively in Texas.

In 1992, the Texas State Board of Education (SBOE) endorsed the initiative for statewide implementation. Beginning in 1993, the Texas Business and Education Coalition (TBEC) engaged school districts and community volunteers across the state in a concerted effort to promote rigorous course completion among students. That same year, prodded by TBEC and the commissioner of public education, the SBOE made the Scholars course of study an official graduation plan. In a relatively few years, the rigor-based strategy to raise student achievement was institutionalized.

Urged on by business volunteers, record numbers of students voluntarily completed a defined sequence of academically rigorous courses. Between 1997 and 2001, completion of geometry increased by 45.8 percent, Algebra 2 by 28 percent, pre-calculus by 54.7 percent, and calculus by 22.7 percent. In science, chemistry course completion increased by 29.1 percent and physics by 68.3 percent. Finally, Year One completion of a language other than English increased by nine percent, Year Two by 17.5 percent, and Year Three by 19.1 percent. The percentage of students in Texas completing the equivalent of the Scholars course of study (Recommended High School Program and Distinguished Achievement Program combined) increased from less than one percent to more than 50 percent (Table 1).

In 1999, the Texas Legislature created the TEXAS Grant. Under the legislation, students with financial need who completed the recommended course of study became eligible for free tuition at in-state public colleges or discounts at in-state private colleges. The Grant catapulted completion of the recommended course of study from 15 percent of high school graduates in 1999 to 59 percent of graduates in 2002. (Table 1)

**Table 1**  
**Texas Students Graduating under High School Programs beyond Minimum**

Class	DAP*	RHSP*	Advanced w/Honor	Advanced	Total
2002	5.79	53.21	0.00	0.00	59.00
2001	4.95	46.14	0.00	0.00	51.09
2000	3.60	46.14	0.30	0.90	39.70
1999	1.40	13.60	12.10	14.10	41.20
1998	0.66	8.00	14.60	16.20	39.50
1997	0.05	1.30	19.40	19.90	40.70
1996	0.09	0.38	19.70	20.40	40.60
1995	0.10	0.17	18.60	20.70	39.57

*\*Graduation plans that meet or exceed Scholars course of study. RHSP = Recommended High School Program. DAP = Distinguished Achievement Program. Source: Texas Education Agency*

*Bold line indicates introduction of TEXAS Grant*

Texas began phasing out lower-level graduation programs (Advanced<sup>41</sup> and Advanced with Honor), aligning all but the Minimum Graduation Plan with the Scholars academic core.

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<sup>41</sup> The Recommended High School Program exceeded the Advanced graduation plan by adding a half social studies credit, two language-other-than-English credits, and eliminating derivative science courses in favor of basic lab science courses.

## The State Scholars Initiative

Research is clear about what constitutes appropriate preparation for higher education and the workplace. In addition, the Texas Scholars program showed that a significantly greater percentage of students can be motivated to enroll in higher level courses if two conditions exist. First, employers must carry the message that rigorous courses today keep open the door to tomorrow's opportunities. Second, communities and states must support students' decisions to engage with more challenging material. As students' expectations for themselves increase, they will demand more from the education system. That demand must be met with qualified teachers, welcoming classrooms, extra help that keeps students from becoming discouraged, and incentives that keep them on track to gain the desired preparation. Ways the business community and educators can convert student self-interest into sustainable high school improvement include:

- academic supports to ensure student success;
- aligning state education policy with rigorous academic course completion;
- determining what qualifies as "Scholars" coursework;
- course content standards;
- state and local data systems to capture Scholars measures; and
- recruiting and developing sufficient numbers of high school teachers who can instruct students in higher-level knowledge and skills.

In sponsoring the State Scholars Initiative (SSI) in August 2002, President George Bush and U.S. Secretary of Education Rod Paige hoped to replicate the concept of using student demand for proper preparation to drive high school improvement.

To date, the national Center for State Scholars has provided assistance and grants of up to \$300,000 to each of 12 statewide business groups to launch State Scholars in their respective states over the next 24 months. State Scholars coalitions, in partnership with each state's governor and chief school officer, have been established by:

- Arkansas Business & Education Alliance;
- Connecticut Business & Industry Association;
- Indiana Education Roundtable;
- Partnership for Kentucky Schools;
- Maryland Business Roundtable for Education;
- Public Education Forum of Mississippi/Mississippi Economic Council;
- Business Coalition for Educational Excellence at the New Jersey Chamber of Commerce;
- New Mexico Business Roundtable for Educational Excellence;
- Oklahoma Business & Education Coalition;
- The Education Partnership (Rhode Island);
- Tennessee Chamber of Commerce & Industry;
- Texas Business and Education Coalition; and
- Partnership for Learning (Washington).

### ***The State Scholars Course of Study***

If a state does not already have a rigorous high school graduation plan, the coalition defines a

model plan to promote as the Scholars course of study that includes three credits of math (Algebra 1, geometry, Algebra 2); three credits of basic lab science (biology, chemistry, physics); four credits of English; three and one-half credits of social studies (chosen from U.S. and world history, geography, economics, and government); and two credits of the same language other than English.

### ***How States Participate***

States that want to implement a Scholars Initiative submit an application to the Center for State Scholars that describes their readiness in four criteria:

- 1. High school reform must be a priority for decision leaders.** The state must demonstrate that policy makers, business leaders, chamber executives, and public school leadership are leading major efforts to improve academic achievement at the high school level through strategies that focus on increasing the rigor of course completion and improving postsecondary and employer engagement.

Partial evidence of this priority is the chief state school officer's ability to identify two local districts for pilot implementations. Each district must be characterized by: a reform-minded superintendent focused on academic achievement through a rigorous course of study; strong local support from a leading employer or group of employers; strong contact persons from both the school district and the business community to direct implementation; demographics that reflect state ethnic and socioeconomic patterns; and a willingness to collect data that helps in evaluating the program. In addition, one of the districts must be in an urban setting and one in a rural setting, with sufficient distance between the two to provide adequate geographic distribution in the state.

- 2. A viable state business-education coalition must exist to house and lead the Scholars effort.** Each state must have a business organization or business-education coalition that is poised to address graduation requirements with the state education agency or state board of education. The coalition must have strong connections with local chambers of commerce and other business-education coalitions, and must be equipped to receive and manage corporate, foundation, and state contributions.
- 3. Key in-state corporations must serve as "flagship" sponsors.** Influential corporations with a presence in the state must be willing to support the development and maintenance of a Scholars Initiative through financial and/or in-kind contributions (such as loaned executives and office space).
- 4. The state policy structure is amenable to alignment with rigorous Scholars course completion.** Each applicant must demonstrate that a graduation plan containing the Scholars Core Course of Study is in place, or make assurances that upon acceptance to the Initiative, the state will define a graduation plan that includes the Scholars Core Course of Study.

The state must also indicate whether it already collects or plans to collect data regarding annual student course completion, standardized assessment performance,

graduation rates, ACT/SAT/college placement, and college-going and college performance information at the high school, school district, and state level, disaggregated by sex, race, and socioeconomic status.

Finally, the state must identify whether student incentives are in place or planned that align with promoting rigorous course completion. Incentives potentially could include merit-based financial aid, university admissions preferences or requirements, employer hiring preferences, and the like.

The application requesting participation in the program must be issued by the board chair or executive director of the state business or business-education coalition and signed by the governor of the state, the chief state school officer, and a state business community leader.

### ***Implementation Model***

At the community level, SSI consists of three complementary activities:

- 1. Explaining the impact a Scholars course of study has on students' future options.** Just before students are asked to decide which high school courses they want to complete, SSI business volunteers visit classrooms to deliver a message directly to students that high school coursework matters to their future academic and career success. Volunteers tell students that:
  - formal learning does not stop after high school or college;
  - to progress to the top pay rate of certain technician classifications, for example, adults must successfully complete many hours of instruction and testing over several years;
  - as technology changes the nature of work, adults need to sharpen old skills and learn new ones;
  - rigorous academic study now prepares them for numerous options after high school; and
  - rigorous academic study can make college more affordable by reducing or eliminating the need for remedial courses.

As a result of information provided by employers about the education and mindset needed to be viable candidates in the job market over the long term, students are better equipped to choose their courses wisely.

- 2. Recognizing and supporting students committed to becoming State Scholars.** Local business volunteers and educators reinforce the value of the Scholars course of study throughout high school via additional presentations, academic supports, and incentives.
- 3. Honoring each high school senior that completes the Scholars course of study.** Each community celebrates the success of its graduating Scholars with an event at the end of the senior year or during commencement exercises.

At the district and state level, SSI includes strategies to sustain high school improvement. Business leaders lead such efforts as:

- 1. Encouraging Scholars to apply for employment at their companies.** Some local businesses are participating in job interview/application days for Scholars to gain valuable interview experience and, possibly, summer, part-time, and full-time jobs.
- 2. Developing or improving student tracking software.** Web-enabled student transcript systems that can be updated in real time and permit electronic transfer of transcripts enable educators to keep track of students on a daily basis so that their needs can be diagnosed and addressed. This strategy helps in identifying students who may need additional support and encouragement to complete the course of study.
- 3. Encouraging institutions of higher learning to adopt the Scholars course of study as a criterion for geographically selective free tuition at two-year community and technical colleges.** In Arkansas, Pulaski Technical College and Arkansas at Fort Smith community colleges offer free or discounted tuition to students who are recognized as Arkansas Scholars. The University of Arkansas Community College at Batesville pays for Scholars' textbooks.
- 4. Encouraging institutions of higher learning to adopt the Scholars course of study as a criterion for preferential or automatic public college and university admission.** Texas' Tarleton State University, for example, offers unconditional admission for freshmen residents who complete the recommended course of study.
- 5. Instituting large-scale merit-based financial aid based on completion of a rigorous course of study.** There is much evidence that offsetting the cost of higher education based on completion of a course of study (the TEXAS Grant model) has several benefits over the alternative strategy of rewarding GPA.

### ***Evaluation***

If the Initiative is advanced by business involvement in a classroom awareness/motivation campaign and state and district education policy, it is institutionalized by the collection and dissemination of data showing increases in the percentage of students completing the Scholars course of study and documenting the success of these students in their lives beyond high school. During the pilot period, each statewide business coalition collects quantitative and qualitative data included in Table 2.

The intent of SSI evaluation is not to draw a causal relationship between the Initiative and student outcomes, but to foster the establishment of adequate data systems that educators can use to monitor student progress and intervene, when necessary, in a timely manner.

**Table 2**  
**Evaluation Plan Outcomes and Measurement Instruments**

<b>Outcomes</b>	<b>Measurement instrument(s)</b>	<b>Quantitative Information</b>	<b>Qualitative Information</b>
Development of a Scholars course of study	<ul style="list-style-type: none"> <li>Center staff report</li> </ul>	<ul style="list-style-type: none"> <li>N/A</li> </ul>	<ul style="list-style-type: none"> <li>Description of policy environment affecting SSI in the state</li> <li>Description of steps taken to develop the course of study by the partner</li> <li>Description of lessons learned during the process</li> </ul>
Establishing scope of intervention	<ul style="list-style-type: none"> <li>Presenter report</li> <li>District data reporting apparatus</li> </ul>	<ul style="list-style-type: none"> <li>Number of presentations given</li> <li>Number of students receiving presentations</li> <li>Number of students enrolled in district on day presentation given</li> <li>Percentage of students physically in class when presentation given</li> <li>Number of presentations given by each speaker</li> </ul>	<ul style="list-style-type: none"> <li>Description of variations in presentation situations (e.g., use of multiple classrooms in a single presentation)</li> <li>Description of method used by district to calculate enrollment on the day(s) presentations given</li> </ul>
Increase number of students completing the Scholars course of study	<ul style="list-style-type: none"> <li>Transcripts of graduating seniors</li> </ul>	<ul style="list-style-type: none"> <li>Percentage of students completing the Scholars course of study for 2002/2003 school year</li> <li>Sex, race/ethnicity, and SES status for the Scholar/non-Scholar groups</li> </ul>	<ul style="list-style-type: none"> <li>Scholars course of study developed by the state partner</li> <li>Description of the difference between the developed Scholars course of study and the minimum graduation requirements in the pilot districts</li> </ul>
Increase number of students taking the classes comprising the Scholars course of study	<ul style="list-style-type: none"> <li>District aggregate course completion records for ninth to 12<sup>th</sup> grade classes</li> </ul>	<ul style="list-style-type: none"> <li>Total number of students for all four grades enrolled in classes comprising the Scholars course of study that represent a higher goal than minimum graduation requirements</li> <li>Sex, race/ethnicity and SES status for the Scholar/non-Scholar groups</li> </ul>	<ul style="list-style-type: none"> <li>Description of district-level challenges in providing the Scholars course of study</li> </ul>
Increase number of students completing courses which exceed the requirements of the Scholars course of study	<ul style="list-style-type: none"> <li>District aggregate course completion records for ninth to 12<sup>th</sup> grade classes</li> </ul>	<ul style="list-style-type: none"> <li>Total number of students for all four grades enrolled in classes marginally above the Scholars course of study (e.g., third year of a language other than English or pre-calculus)</li> </ul>	<ul style="list-style-type: none"> <li>Additional description of district level challenges in providing specific course within the Scholars course of study</li> </ul>
Student achievement on college entrance examinations	<ul style="list-style-type: none"> <li>ACT</li> <li>SAT</li> </ul>	<ul style="list-style-type: none"> <li>ACT and SAT scores for Scholars and non-Scholars, disaggregated by sex, race/ethnicity, and SES</li> </ul>	<ul style="list-style-type: none"> <li>Description of statewide ACT/SAT results</li> <li>Comparison of pilot district results with statewide results</li> </ul>
Student achievement on statewide measures of academic assessment	<ul style="list-style-type: none"> <li>State assessment instruments</li> </ul>	<ul style="list-style-type: none"> <li>Assessment scores for Scholars and non-Scholars, disaggregated by sex, race/ethnicity, and SES</li> </ul>	<ul style="list-style-type: none"> <li>Description of statewide testing regime</li> <li>Description of 2002/03 implementation of statewide testing regime for Grades 9 to 12</li> <li>Comparison of pilot district results with statewide results</li> </ul>
Student achievement in high school and beyond	<ul style="list-style-type: none"> <li>District data reporting apparatus</li> <li>State department of education reporting apparatus</li> <li>Higher education reporting apparatus</li> </ul>	<ul style="list-style-type: none"> <li>Graduation rate</li> <li>Dropout rate</li> <li>Percentage of students enrolling in higher education (if available)</li> <li>Percentage of students in remediation (if available)</li> <li>Disaggregation of above variables by sex, race/ethnicity, and SES status</li> </ul>	<ul style="list-style-type: none"> <li>Description of expected future challenges to reporting post-high school data</li> </ul>

## Conclusion

Two states have experienced concrete benefits from the State Scholars Initiative. Based on data compiled in Texas and Arkansas, the potential for success in other states is substantial.

- Between 1990 and 2000, the percentage of Arkansas graduates completing a second year of algebra rose from 48 percent to 71 percent, while those completing chemistry rose from 33 percent to 63 percent.<sup>42</sup>
- Between 1990 and 2001, the percentage of Arkansas students going to higher education increased from 48.3 percent in 1990 to 59.4 percent.<sup>43</sup> Between 1998 and 2002, when college enrollment grew seven percent, the college remediation rate remained stable and in some cases declined.<sup>44</sup>
- Texas students completing the Scholars course of study score on average 102 points higher on the SAT<sup>45</sup> and 2.4 points higher on the ACT<sup>46</sup> than those completing a less rigorous course of study.
- Between 1999 and 2002, as a result of instituting the broad-based TEXAS Grant based on a combination of financial need and completion of the Scholars course of study, the percentage of Texas high school students graduating under the Scholars course of study rose from 15 percent in 1999 to greater than 59 percent in 2002.<sup>47</sup>
- In 2000, 58 percent of Texas high school graduates who completed the Scholars course of study or higher curriculum enrolled directly in public higher education, compared with 34 percent of students graduating with a minimum or individual education plan diploma. The persistence rate<sup>48</sup> for students enrolled in four-year public universities who completed the more rigorous course of study was 90 percent, compared with 84 percent for students who earned a minimum diploma. The persistence rate for students enrolled in two-year public colleges who completed the recommended program was 76 percent compared with 63 percent for students who earned a regular diploma.
- More than 80 percent of students in the class of 2000 who receive free tuition and fees under the TEXAS Grant based on financial need and completion of the recommended program maintained a college GPA that entitled them to retain their grants.<sup>49</sup>

If past patterns identified in three long-term studies hold true, students who graduate after completing the Scholars course of study will be: twice as likely to be college-ready as their peers

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<sup>42</sup> Chief State School Officers State Indicators of Science and Mathematics Education, 2001, pp. 32 and 37.

<sup>43</sup> SIS, NCES, Digest of Education Statistics 2002, Table 185.

<sup>44</sup> Arkansas Department of Higher Education, Student Enrollment 2000 and Student Enrollment 2002, <http://www.arkansashighered.com/RP-Enroll-SSCH.html>.

<sup>45</sup> College Board 2000, 2000 Profile of College-bound Seniors: Texas, Princeton, N.J.

<sup>46</sup> ACT, *High School Profile Report*, 2002.

<sup>47</sup> Texas Education Agency, Academic Excellence Indicator System (AEIS) Reports, <http://www.tea.state.tx.us/perfreport/aeis/>.

<sup>48</sup> Calculated by tracking students initially enrolled in fall 2000 to determine if they still were enrolled in fall 2001.

<sup>49</sup> Legislative Oversight Committee on the TEXAS and Teach for Texas Grant programs, December 2000.

completing minimum graduation plans; more likely to complete an associate's or bachelor's degree; and able to earn more in the years after high school.<sup>50</sup>

As of this report, 13 business-education coalitions have defined a Scholars course of study and are conducting Scholar presentations in more than 500 school districts around the country, including more than 150 outside of Texas. That number is continuing to grow as more states join the Initiative. The experience of pilot states has shown that the more the State Scholars concept spreads, and the more businesses become involved and committed to participating, the more credibility and esteem a student's designation as a State Scholar will command. The result of the State Scholars Initiative will be a high level of awareness of the importance of academic achievement among students, and a thorough understanding within the business and education communities of the policies and strategies that bring about a culture of achievement in American high schools.

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<sup>50</sup> Adelman, 1999.