

# Policy Perspective

## Solving the Math and Science Teacher Shortage

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### RECOMMENDATIONS

#### Reduce certification barriers:

- Create a true alternative certification program for qualified professionals with college degrees and work experience.
- Give principals the flexibility to waive certain state certification requirements without penalty.

#### Make teacher compensation more competitive:

- Abolish the statewide minimum salary schedule.
- Encourage school districts to independently determine teacher salaries based off of free-market principles of supply and demand.
- Encourage school districts to measure and reward teacher quality with incentive pay.

As Texas schools continue to face a shortage of certified math and science teachers, students continue to be taught by individuals without math or science training. The Texas Education Agency once again designated mathematics and science as subject-matter teacher shortage areas<sup>1</sup> for the 2006-07 school year.<sup>1</sup>

With the supply of certified math and science teachers artificially restricted by various laws, regulations and policies, schools assign teachers certified in other fields to teach this subject. This is called out-of-field teaching, which is defined as either lacking certification or lacking a college major or minor in the assigned teaching field. In 2006, 14.3 percent of math teachers, 28 percent of science teachers, and 52.2 percent of computer science teachers were teaching out-of-field in Texas classrooms.<sup>2</sup>

### Out-of-Field Teaching in Texas, 2006

Subject Area	Teachers Out-of-Field
Math	14.3 %
Science	28 %
Computer Science	52.2 %

Source: Texas Education Agency

The demand for math and science teachers will continue to increase as the “four-by-four” curriculum requirements go into effect for freshmen in the 2007-08 school year. The “four-by-four” requires high school students to take four math courses and four science courses in order to graduate on the recom-

mended graduation plan—the default plan for high school graduation.

### CERTIFICATION BARRIERS

State teacher certification requirements artificially limit the supply of qualified teachers and are a barrier to entry for many qualified individuals wanting to enter the teaching profession.

Texas’ traditional and alternative certification process is prescriptive, time-consuming, expensive, and full of unnecessary requirements. Occupational licensing, like regulating teacher certification, is a way for the government to control entry into a profession and as a result limit the career choices of our citizens. This has prevented many talented, aspiring teachers from teaching in public schools. Milton Friedman, the Nobel Prize-winning economist, believed the trouble with licensing occupations is more than a problem of state intervention, it “is a serious infringement on the freedom of individuals to pursue activities of their own choice.”<sup>3</sup> Friedman goes on to explain that registration, certification, and licensing all have a social cost by invariably allowing members of the occupation itself to control entry into the profession and thus obtain a monopoly position at the expense of the public.<sup>4</sup>

Burdensome and unnecessary alternative certification requirements discourage a large number of bright industry professionals and experts from transitioning from the private

<sup>1</sup>Other shortage areas include special education, foreign language, bilingual/ESL, and technology applications.

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**TalkingPoint:**

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sector, government, or higher education into a public high school classroom. It is counter-intuitive that an individual with a Master's degree in computer science and over 28 years of work experience at IBM can teach at the college level, but is not welcome to teach at public high schools because he or she is not "certified" by the state.<sup>5</sup> In light of low test scores, poor graduation rates, and the shortage of math and science teachers, schools need the ability to think outside the box and be able to hire well-qualified teacher applicants without penalty by the state or federal government.

Furthermore, state certification rules limit the flexibility of principals to put the most qualified math or science teacher in the classroom by preventing them from taking into account teaching ability, outstanding accomplishments, work history, and education level in their hiring decisions. Principals need the flexibility to exercise independent judgment and hire those individuals which they believe will best serve their school and students regardless of their certification status. Steve Jobs, CEO of Apple Inc, compares the job of a school principal to that of a small business CEO saying that without the power to make necessary staff changes, and reward effective teachers with higher salaries, public schools will not attract the best and the brightest to lead our schools.<sup>6</sup> One option would be to give principals the authority to waive certain state certification requirements if they think the individual's qualifications warrant it and it is the best interest of students to have that individual in the classroom. Schools could provide intensive professional development and mentoring to assist new teachers in the transition.

A streamlined alternative certification process is another way to reduce certification barriers. Individuals with college degrees,

extensive subject matter knowledge in math and science, and relevant work experience could test out of content requirements, and take a month's worth of courses on teaching fundamentals, classroom management, and how to teach special needs students. This is a far shorter process that gives individuals credit for relevant qualifications and experience. It also allows them to enter the classroom in a shorter amount of time—at a reduced cost—benefitting both aspiring teachers and students.

It is important to note that the lack of certification does not necessarily mean that a teacher is unqualified to teach a particular subject. Thus, lowering certification barriers does not equal a reduction in teacher quality.

### MAKING PAY MORE COMPETITIVE

No idea is more readily connected to free markets than that of competition. This principle promotes and rewards innovation and excellence. Unfortunately, teacher salaries are not based on a competitive pay scale. Many school districts determine teacher salary calculations on terminal degree and years of teaching experience and do not include the quality of instruction. As school districts continue to struggle to find "certified" math and science teachers, some districts are embracing a more competitive approach with shortage stipends, hiring bonuses, and incentive pay.

#### *Shortage Stipends*

Additional compensation based on market demand is one way schools can address the lack of competitive pay for math and science teachers, who can often make more money working in the private sector. Individuals with strong math or science backgrounds and skills have larger earning potential in the private sector over their lifetime than as

<sup>5</sup>The average teacher salary statewide for teachers with over 20 years of experience was \$51,998 for the 2005–2006 school year. In comparison, the average salary for teachers with more than 20 years of experience at Houston ISD was \$58,441 and at Dallas ISD was \$61,445.

a teacher. For example, the average starting teacher salary in Texas last year was \$34,505 and will most likely be capped at approximately \$65,000 or \$70,000 for teachers in the highest paying districts with over 20 years of experience.<sup>ii7</sup> However, workers with excellent math and science skills and a science or technical degree makes an average salary of \$73,312.<sup>8</sup> Their earnings are not capped and can be upwards of 70, 80 or 90 thousand dollars a year depending on their skills, their job responsibilities, and the market.

When individual campuses and districts choose the method and amount of teacher compensation to meet local needs, inevitably resources are allocated more efficiently.

According to the 2007 Texas Association of School Boards and Texas Association of School Administrators Teacher Salary Report, 19.8 percent of school districts (205 school districts) pay shortage stipends for math teachers and 15.1 percent (156 school districts) pay shortage stipends for science teachers.<sup>9</sup>

**Hiring Bonuses**

Texas school districts are also attracting math and science teachers to the field with hiring bonuses. During the 2006-07 school year, 7.8 percent of school districts (81 school districts) paid 3,887 new teachers a hiring bonus.<sup>10</sup> The average hiring bonus was \$2,049 with bonuses ranging from \$250 to \$10,000.<sup>11</sup> Seventy-five percent of the districts paying hiring bonuses only used them for hard-to-fill teaching positions such as bilingual education, foreign language, special education, math, and science.<sup>12</sup> While bilingual education teachers had been the largest recipients of hiring bonuses in recent years, last year mathematics and science teachers were the primary recipients of the hiring bonuses.<sup>13</sup>

**Sample of Districts Offering Critical Shortage Area Stipends, Survey Year 2006-07**

School District	Enrollment	Math	Science
Agua Dulce ISD	370	\$3,500	\$3,500
Aldine ISD	58,500	\$3,000	\$3,000
Archer City ISD	470	\$3,600	
Beaumont ISD	19,555	\$1,500	
Bloomington ISD	949	\$5,000	\$2,500
Brownsville ISD	48,500	\$1,300	\$1,300
Corsicana ISD	5,500	\$3,000	\$3,000
Cypress-Fairbanks ISD	91,000	\$3,000	\$3,000
Dallas ISD	159,903	\$2,500	\$2,500
Dime Box ISD	176	\$3,000	\$2,000
Ector County ISD	26,000	\$1,500	\$1,500
El Paso ISD	62,892	\$1,100	\$1,000
Fort Worth ISD	71,728	2,000	
Frisco ISD	24,074	\$1,200	\$1,200
Galena Park ISD	21,057	\$5,000	\$5,000
Houston ISD	210,292	\$1,000	\$1,000
Killeen ISD	36,738	\$1,300	\$1,300
Klein ISD	40,675	\$1,000	\$1,000
Laredo ISD	24,559	\$1,800	\$2,300
May ISD	265	\$2,000	\$2,000
Mount Pleasant ISD	5,459	\$1,000	\$1,000
New Deal ISD	730	\$2,500	\$2,500
San Antonio ISD	55,000	1,000	1,000
Seguin ISD	7,532	\$1,500	\$1,500
Texline ISD	155	\$10,000	
Tyler ISD	17,554	\$2,000	
Waco ISD	15,517	4,000	\$1,000
Waxahachie ISD	6,238	\$1,000	\$1,000
Westbrook ISD	225	\$4,000	2,000
Wimberley ISD	1,960	\$3,000	\$3,000

Source: TASB/TASA Teacher Salary Report, 2006-2007

**Incentive Pay**

Many school districts calculate teacher salaries using the state’s minimum salary schedule, which bases compensation on the different levels of terminal degree (from bachelor’s degree through doctorate) and

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the number of years teaching. The minimum salary schedule is anti-competitive at its core by rewarding mediocrity the same as excellence.

Another way to attract excellent math and science teachers is to reward excellence. School districts can measure the quality of instruction and give bonuses to teachers that excel in the classroom. During the 2006 special session, the Texas Legislature passed the largest teacher incentive pay program in the nation. While funded by the state, this program is locally designed at the district or campus level.

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The program aims to reward classroom teachers for improving student achievement (as demonstrated with objective, quantifiable measures) and for contributing to improving overall student performance by collaborating with school faculty. School districts that participate in the program are encouraged to give awards between \$3,000 and \$10,000.

Unfortunately, less than one year after creating the statewide incentive pay program, lawmakers substantially scaled back the program's funding in the most recent legislative session. By diminishing this program, Texas lawmakers decreased potential earnings of the best Texas teachers and conveyed the message to teachers that quality is not rewarded.<sup>14</sup>

Individual school districts indicate that they find value in pursuing incentive pay programs, as many of them are designing their own programs separate from the state program. During the 2006-07 school year, 8.7 percent of school districts (90 school districts) had some type of locally-devised performance pay program.<sup>15</sup> Local programs are best suited for teacher incentives because they can be tailored to individuals and school-wide trends. When it is left up to individual school districts and its constituent schools to decide the method and amount of compensation for their teachers, resources will be allocated most efficiently.

## CONCLUSION

Texas will continue having difficulty finding state "certified" math and science teachers until Texas policymakers reduce certification barriers and Texas school administrators incorporate competition into their pay structure. Texas students deserve the opportunity to learn from the best and most qualified teachers available. With a general understanding of marketplace principles, a reduction of state certification barriers, and a more competitive pay structure, it is possible for Texas to attract excellent math and science teachers to teaching. ★

## RECOMMENDATIONS

### *Reduce certification barriers:*

- Create a true alternative certification program for qualified professionals with college degrees and work experience by allowing them to test out of content requirements and requiring only a month or two of course work in pedagogy.
- Give principals the flexibility to waive certain state certification requirements without penalty, thus allowing them to hire the most qualified individual to teach regardless of certification status.

### *Make teacher compensation more competitive:*

- Abolish the statewide minimum salary schedule.
- Encourage school districts to independently determine teacher salaries based off of free-market principles of supply and demand. School districts can provide teachers in shortage areas more compensation with shortage stipends and hiring bonuses.
- Encourage school districts to measure and reward teacher quality with incentive pay.

## ENDNOTES

<sup>1</sup> Texas Education Agency, letter to school administrators (Feb. 2007) <http://www.tea.state.tx.us/taa/comm032007.html>.

<sup>2</sup> Texas Education Agency, data on out-of-field teaching for math, science and computer science teachers as of August 2006, obtained from agency by author on 16 Feb. 2007.

<sup>3</sup> Friedman, Milton. "Capitalism and Freedom" (University of Chicago Press, 2002) 142.

<sup>4</sup> Friedman, Milton. "Capitalism and Freedom" (University of Chicago Press, 2002) 148.

<sup>5</sup> Phone interview with Don Van Slyke of Irving, Texas (24 Sept 2007). He attempted to teach at several public high schools and was turned down due to his lack of "certification" even though he has a master's degree in computer science and over 25 years working at IBM.

<sup>6</sup> "Apples' Jobs blasts teachers unions," *AppleInsider* (19 Feb. 2007) [http://www.appleinsider.com/articles/07/02/19/apples\\_jobs\\_blasts\\_teachers\\_unions.html](http://www.appleinsider.com/articles/07/02/19/apples_jobs_blasts_teachers_unions.html).

<sup>7</sup> Texas Education Agency, Division of Performance Reporting, Academic Excellence Indicator System, 2005-2006 State and Individual School District reports, <http://www.tea.state.tx.us/perfreport/aeis/2006/index.html>.

<sup>8</sup> Texas Workforce Commission.

<sup>9</sup> Texas Association of School Boards and Texas Association of School Administrators, "Salaries and Benefits in Texas Public Schools 2006-2007" and Texas Association of School Boards and Texas Association of School Administrators, "Critical Shortage Area Stipends, For Survey Year 2006-07, All Respondents."

<sup>10</sup> Texas Association of School Boards and Texas Association of School Administrators, "Salaries and Benefits in Texas Public Schools 2006-2007."

<sup>11</sup> *Ibid.*

<sup>12</sup> *Ibid.*

<sup>13</sup> *Ibid.*

<sup>14</sup> Story, Jamie. "Facts About Incentive Pay: House Plan Does Not Raise Average Teacher Salary," Texas Public Policy Foundation (2007) <http://www.texaspolicy.com/pdf/2007-04-PB18-incentivepay-js.pdf>.

<sup>15</sup> Texas Association of School Boards and Texas Association of School Administrators, "Salaries and Benefits in Texas Public Schools 2006-2007."

## About the Author

Brooke Dollens Terry is an education policy analyst at the Texas Public Policy Foundation's Center for Education Policy.

Before joining the Foundation, she worked at the Texas Workforce Commission in government relations and as a policy analyst for Commissioner Diane Rath. At the Workforce Commission, Brooke researched and analyzed child care, welfare, foster care, food stamps and a host of other workforce policy issues.

Prior to working in state government, Brooke worked in Washington D.C. for U.S. Senator Phil Gramm for two and a half years analyzing federal legislation and policy in the areas of banking, housing, education, welfare, judiciary and social issues. Upon Senator Gramm's retirement, Brooke worked for U.S. Senators John Cornyn and Richard Lugar as a legislative assistant. In Senator Lugar's office, she specialized in children nutrition issues.

During college, Brooke interned in U.S. Senator Kay Bailey Hutchison's press office in Washington D.C., and in then-Governor George W. Bush's criminal justice division in Austin. Brooke graduated cum laude from Baylor University with a Bachelor of Arts in Political Science. During her time at Baylor University, Brooke was actively involved with Baylor Ambassadors, student government, and Pi Beta Phi.

A fifth generation Texan, Brooke grew up in Houston and now resides in Austin with her husband.

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