

# Does Bilingual Education Work?

## The Case of Texas



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## Executive Summary

Texas is a large growing state due in part to high-birth rates and individuals choosing to move to Texas from other states and countries. According to the state demographer, one rapidly expanding demographic is the Hispanic population, which is expected to double between 2000 and 2025 from 6.6 million people to more than 13.4 million people.

The number of students in Texas public schools that are not proficient in English\* continues to grow. In the 2008-09 school year, Texas had 448,917 students in bilingual education.† Between 1992 and 2006, Texas' English Language Learner student population increased by 84 percent. Currently, 99 percent of the students enrolled in Texas bilingual education programs are Hispanic.

As Texas' Hispanic population and immigrant population continues to grow, it is critically important that state leaders and policymakers look at the facts on how to best teach English to non-English speaking children.

The goal of any type of program teaching English to non-English speaking children should be learning English. Yet, opinions vary and tempers flare over which program—bilingual education or sheltered English immersion—teaches English most effectively.

Sometimes the term “bilingual education” is used loosely to refer to any type of English teaching program. For the purposes of this study, bilingual education is defined as instruction provided to students in their native tongue in all subjects in a self-contained classroom with other students that speak the same language. English is typically taught by the bilingual education teacher. English-as-a-Second Language (ESL) instruction is defined as a program of small group English instruction by a certified ESL teacher whose students typically spend the rest of the day in a mainstream classroom. Sheltered English immersion is de-

defined as instruction provided to students in English at a pace they can understand, taught by a trained ESL teacher, in a self-contained classroom with other students learning a second language.

Consider some key facts:

- Texas is one of only four states currently requiring bilingual education. The other three states are Illinois, New Jersey, and New York.
- Texas is one of only 10 states that have ever required bilingual education. The other nine states are California, Connecticut, Illinois, Indiana, Massachusetts, New Jersey, New York, Washington, and Wisconsin.
- Bilingual education is more expensive‡ than other programs and is the least educationally effective. (Bilingual education is more expensive than mainstreaming or sheltered English immersion, and is less effective.)
- Students in bilingual education are not required to be tested on the English TAKS for the first three years. Testing all English Language Learners in English is the best way to hold schools accountable for the English language acquisition of their students and an excellent way to give schools credit for the extraordinary job they do of teaching English and content such as math and science to non-English speaking students.

### Recommendations:

- Adopt sheltered English immersion as the default for Texas public schools;
- Give parents choice to pick the program that best meets their child's needs in learning English; and
- Test all English Language Learner students on the English TAKS.

\* Non-English speaking children are often referred to as Limited English Proficient (LEP) or English Language Learners (ELL).

† In the 2007-08 school year, Texas had 424,039 students in bilingual education. In the 2006-07 school year, Texas had 396,951 students enrolled in bilingual education. This data was provided to the author by the Information Analysis Division of the Texas Education Agency by email, as the state lumps bilingual education and ESL instruction enrollment data together.

‡ Ranging from \$211 to \$402 more per student per year.

## Bilingual Education in Texas

Bilingual education, according to theory and in Texas state law, is instruction in which students learn to read and write in the native tongue while gradually transitioning to English. Although this definition seems straightforward, much confusion exists nationwide over exactly what bilingual education is. Programs taught in English are often called bilingual education if the students in that program are classified as English Language Learners (ELL) or Limited English Proficient (LEP).<sup>\*</sup> The purpose of this report is to explain what bilingual education actually is, to show how educationally effective it is for ELL students, and to discuss its cost. Finally, this report provides recommendations for changes in Texas law and regulations having to do with bilingual education.

According to a recent *Education Week* survey, Texas is one of only four states in the U.S. that currently require bilingual education.<sup>†</sup> Moreover, Texas is one of only 10 states that have ever required bilingual education.<sup>‡</sup> As shown in Appendix 1, among the 50 states, Texas is second in the total number of ELL students (638,863) and fifth in the percentage of the public school population classified as ELL (14.1 percent). None of the states having more ELL students or a higher percentage of ELL currently *requires* bilingual education, as Texas does.

Bilingual education began in Texas on June 3, 1973, with enactment of the Bilingual Education and Training Act (SB 121) mandating that all Texas public elementary schools enrolling 20 or more children of limited English ability in a given grade level provide bilingual instruction. This abolished the English-only teaching requirement then in effect. According to

current Texas law,<sup>§</sup> bilingual education is defined as “a full-time program of dual-language instruction that provides for learning basic skills in the primary language of the students enrolled in the program” and “incorporates the cultural aspects of the students’ backgrounds.”

The Act asserts the superiority of native-tongue instruction and requires the districts affected to offer:

- a bilingual education program in *elementary* school beginning with kindergarten;
- a choice of bilingual education, instruction in English-as-a-Second-Language (ESL), or other transitional language instruction approved by the agency in *middle* school; and
- English-as-a-Second-Language in grades *9 through 12*.

To be clear, then, as to the definition: Bilingual education is instruction provided to students in their native tongue in all subjects in a self-contained classroom with other students who speak the same language. The students are also taught English, typically by their bilingual education teacher. English-as-a-Second-Language is a pullout program with instruction in English in a small group setting taught by a certified ESL teacher. If a student is labeled as being in an ESL program that indicates that the student is being pulled out from a mainstream classroom. Sheltered English immersion is instruction provided to students in English at a pace they can understand, taught by a trained ESL teacher, in a self-contained classroom with other students learning a second language. It is not mentioned in Texas law.

<sup>\*</sup> The more recent term English Language Learners is used in this report. However, the term Limited English Proficient (LEP) is also used in Texas and in the past almost exclusively.

<sup>†</sup> The other three are Illinois, New Jersey, and New York (see also Education Week and Zehr, 2007, although she errs in including New Mexico).

<sup>‡</sup> The 10 states are California, Connecticut, Illinois, Indiana, Massachusetts, New Jersey, New York, Texas, Washington, and Wisconsin. Garcia and Morgan (1997) err in including Alaska and New Mexico in this list.

<sup>§</sup> See <http://www.tea.state.tx.us/curriculum/biling/tec5164.html>, education code 29.051-29.064.

### ***Trends in ELL Enrollment and Enrollment Ethnicity and Race***

Appendix 2 shows the trends in enrollment by ethnicity and race in Texas public schools as well as the number of students who are designated ELL from the 1992-93 school year through the 2006-07 school year.\* The public school population of Texas as of 2006-07 was about two-thirds nonwhite and 46 percent Hispanic, an increase in the Hispanic population of about 10 percentage points since 1992-93. The ELL population has increased by about 84 percent from more than 398,000 in 1992-93 to more than 731,000 in 2006-07.†

Appendix 3 shows trends by race/ethnicity in bilingual education enrollment and the ELL population in Texas public schools from 1992-93 through 2006-07.‡ Although 93 percent of the ELL population is Hispanic (Appendix 3), only 32 percent of Hispanics are classified as ELL (Appendix 2). Nevertheless, only 2 percent of non-Hispanic students are ELL. The bilingual education enrollment is 99 percent Hispanic. Therefore, we can say that the ELL population in Texas is Hispanic and that it is the Hispanic ELL students who are in bilingual education.

In the 2006-07 school year, 396,951 students were enrolled in bilingual education in Texas (Appendix 4).§ As shown in Appendix 4, almost all the ELL students enrolled in bilingual education are in grades PK-5. This is what one would expect, given that Texas Education Code 29.051-29.064 states that only *el-*

*ementary* schools (with 20 or more ELL students in any language classification in the same grade level) *must* offer a bilingual education program beginning in kindergarten. Middle schools have a choice of bilingual education, instruction in English-as-a-Second Language, or some other “approved” transitional language program.

High schools need provide ESL only in grades 9 through 12, although there is no prohibition against offering bilingual education. With only one percent of the bilingual education enrollment at the middle school level (grades 6, 7, 8 in Appendix 4) and almost none at the high school level, it appears that, given a choice, schools do not opt for bilingual education. Indeed, I predict that if elementary schools were given a choice between bilingual education and English instruction, we would see a sharp decline in bilingual education enrollment in Texas (see Rossell, 2002).

### **The Effectiveness of Bilingual Education in Texas**

This section will examine two important outcomes for grades 3, 4, and 5, the elementary grades in which achievement tests are administered, and which also have significant bilingual education enrollment. The first outcome is the percentage of ELL students in a school *tested* in English on the Texas Assessment of Knowledge and Skills (TAKS) and the second is the

\* The data for 2000 on in both Appendices 2 and 3 were downloaded from the Academic Excellence Indicator System online at <http://www.tea.state.tx.us/perfreport/aeis/2005/DownloadData.html>. Data for years earlier than that were provided by the Information Analysis Division of the PEIMS Ad Hoc Reporting and the Student Assessment Division, both in the Texas Education Agency. In addition, because the public AEIS data does not distinguish between bilingual education and ESL programs, labeling both as bilingual education, I often had to make special requests for data that distinguished between the two. Sometimes it was available (enrollment by school and grade, for example) and thus provided to me by email. Sometimes it was not available at all (budgetary data, for example). Although the TEA staff were quite helpful and generous with their data and time and often provided me with better data than was available on their web site, privacy restrictions meant that I could not receive individual level data that the assessment staff have access to. The smallest aggregation that I could receive was groups of students in schools.

† These numbers, obtained from the Texas Education Agency, are estimates that vary slightly depending on the source.

‡ The data were provided by the Information Analysis Division of the Texas Education Agency by email as the state website lumps bilingual education and ESL instruction together.

§ See previous note.

Bilingual education is instruction provided to students in their native tongue in all subjects in a self-contained classroom with other students who speak the same language.

average school ELL scale scores on the TAKS tests in English.

According to Texas state regulations, all school districts that are required to provide bilingual education and/or ESL programs must establish and operate a Language Proficiency Assessment Committee (LPAC) in the schools where these programs are provided. This committee makes decisions regarding the identification, education, and assessment of ELL students.\*

The TAKS, mandated by the Texas Legislature in 1999 and first administered in 2002-03, assesses reading/English Language Arts, writing, mathematics, science, and social studies. It is currently the high school exit test.† The TAKS is administered in Spanish and in English in grades 3-6 only.

The Language Proficiency Assessment Committee (LPAC) in elementary schools determines who takes which version. The LPAC also determines who is exempted from the TAKS altogether. The goal, according to state law, is to limit Spanish test-taking and/or exemption to three years.

The English TAKS is not an overly demanding test. Peterson and Hess (2005) assigned grades from A to F, depending on the degree to which the percentage proficient on a state test matched the percentage proficient on the National Assessment of Educa-

tional Progress (NAEP) in the same year. An A meant that the state percentage proficient was at or below the NAEP percentage proficient. An F meant the state percentage proficient was far above the NAEP percentage proficient. The percentage of Texas students ranked as proficient on the 2003 TAKS was far higher than on the NAEP that same year. And thus, Texas was one of only two states to which Peterson and Hess gave an F. Texas' 2005 TAKS scores, compared with their NAEP scores, promoted the state to a D+ overall (Peterson and Hess, 2006). In 2007, however, Texas' TAKS scores were again so much higher than its NAEP scores that its overall rating fell to a D (Peterson and Hess, 2008).

### ***Percentage of ELL Students Tested in English on TAKS Tests***

Because ELL students can take the Spanish, rather than the English, version of the TAKS, or be exempted altogether, the extent to which English test-taking varies by program can be thought of as an important outcome of the program. If one program has a higher rate of ELL students who are able to take the TAKS in English, that program should be thought of as more successful in teaching English.

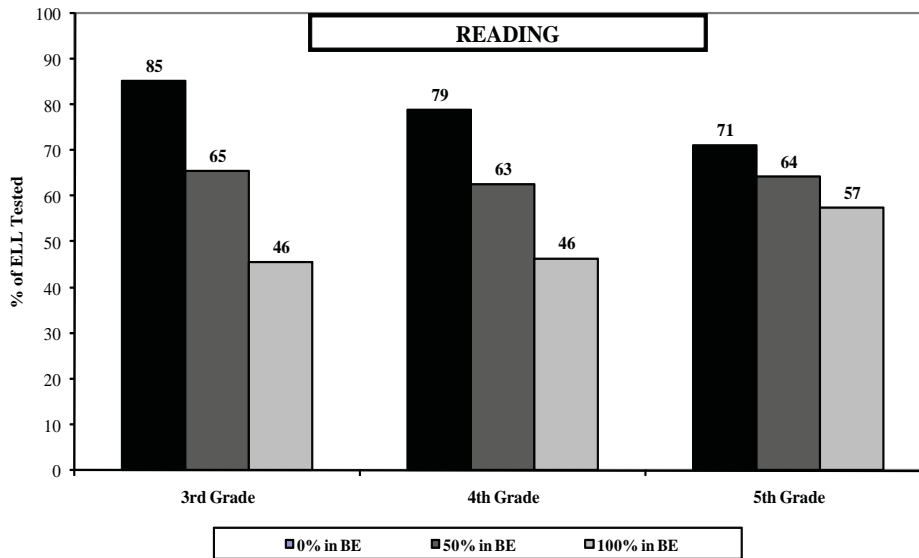
As explained in Appendix 5, across all grades (the bottom row), the total percentage of ELL students tested in reading in English is 60 percent, the percentage of non-ELL students is 88 percent.‡ There is also little difference among reading, social studies,

\* See 19 Texas Administrative Code (TAC) Chapter 89. Adaptations for Special Populations. Subchapter BB.

† The high school TAKS tests and exit exam will be replaced by a series of end-of-course exams starting with the 2011-12 school year per S.B. 1031 passed by the 80th Texas Legislature.

‡ The data analyzed are for 2006-07 because the only data available online for the 2007-08 school year as of the writing of this report are the assessment test results.

Figure 1: % of ELL Students Tested in English on the TAKS Reading Test by % of ELL Students in Bilingual Education, Texas Public Schools\* 2006-07



\* Excludes charter and special education schools and schools with <10 ELL students in the grade analyzed.

Note: Figure 1 controls for the % of ELL students in grade and % of poor students in the school.

writing, math, and science testing rates for ELL students, although most people would think the math and science tests, being less language-based, would produce higher rates. In fact, as noted elsewhere, ELL math testing rates in English are not much higher than ELL reading testing rates in English. This is because translating math facts and procedures learned in one language to another language can be hard at the elementary level, where much math learning is language-based (Rossell, 2002; Rossell and Baker, 1996a, 1996b).

The public Texas database does not separate the test scores of ELL students enrolled in bilingual education from those in English instruction. Therefore, this study uses a common statistical method, multiple regression analysis, to estimate the effect of the percentage of ELL students enrolled in bilingual education in grades 3, 4, and 5 in a school on the percentage of ELL students taking tests.\*

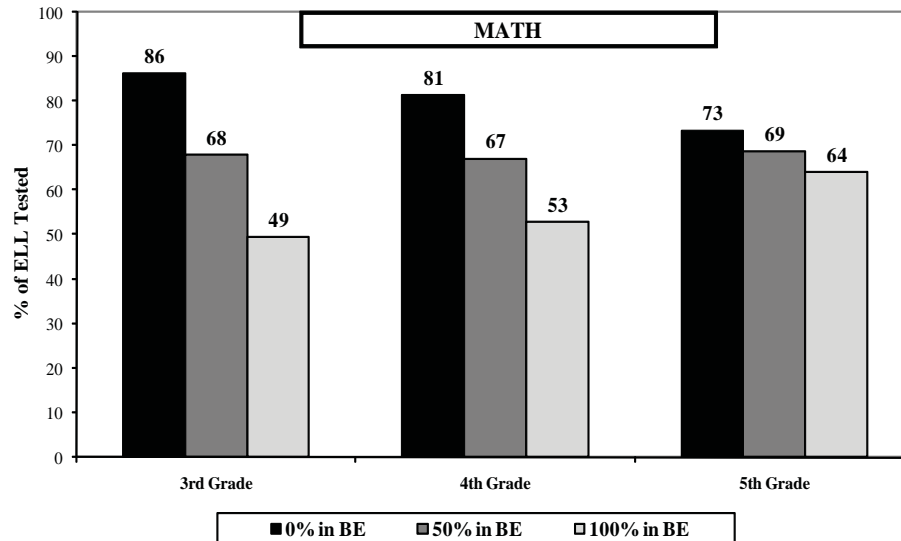
Figure 1 illustrates the effect of bilingual education by mathematically solving the equations (explained in Appendix 6 and shown in Appendix 6a, 6b, and 6c) for 0, 50, and 100 percent of ELL students enrolled in bilingual education and for the mean of the other explanatory variables: the percentage ELL in a grade and the percentage of poor† students in a school. If no third grade ELL students are enrolled in bilingual education, the percentage of those students tested on the TAKS English Reading exam is 85 percent. If all are enrolled in bilingual education, the percentage tested falls to 46 percent. This means a gap of 39 percentage points for third graders after what amounts to five years of bilingual education for many of them. In short, the effect of bilingual education is strongly negative, not just in the third but also in the fourth and fifth grades. That assessment includes some fifth graders who have received seven years of bilingual education.

\* The number of ELL students in bilingual education in a grade and school were obtained by special request.

† The definition of poverty (labeled “economically disadvantaged” in the database) is 1) being eligible for free or reduced lunch or 2) being at or below the poverty line, receiving TANF/public assistance, a Pell grant, JTPA Title II, or food stamps in 1977.



Figure 2: % of ELL Students Tested in TAKS Math Test by % ELL Students in Bilingual Education, Texas Public Schools\* 2006-07



\* Excludes charter and special education schools and schools with <10 ELL students in the grade analyzed.

Note: Figure 2 controls for the % of ELL students in grade and % of poor students in the school.

Figure 2, which illustrates the effect of bilingual education on math, shows much the same pattern as reading. The negative effect, though greatest for third grade, is still negative for grades 4 and 5, after six or seven years of bilingual education for many of these students. Figure 3 (next page) illustrates the effect of bilingual education on writing and science. The TAKS writing test is administered only in grade 4, the TAKS science test only in grade 5 for elementary students. After six years of bilingual education for many of these students, the effect of it is strongly negative on testing in English writing. The gap for the fifth grade science test between no bilingual education and total bilingual instruction is only six percentage points. This is nonetheless statistically significant, and more important than the percentage poor in a school and the percentage ELL in that grade.

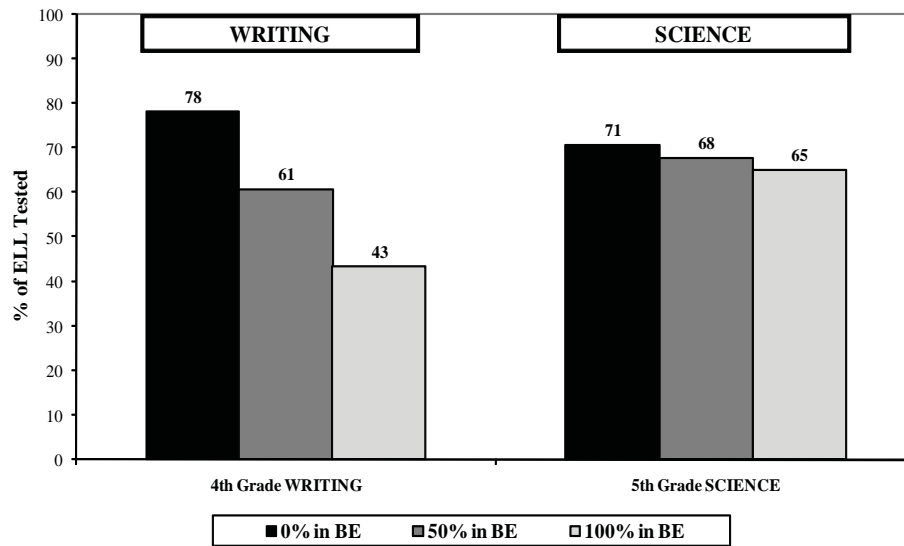
What these results show is that bilingual education is given an unfair advantage in comparison to other programs for ELL students because it tests fewer ELL students in English. In other words, *the untested students disappear from public scrutiny*. The small number of researchers who have looked at this issue in other states, and on a nationwide basis, have discovered a similar phenomenon (Rossell, 2002; Bali, 2000; Los Angeles Unified, 1998; Ramirez, et al. 1998).

What I have done here is to treat this bias as an important outcome showing that bilingual education does not keep up with English instruction for ELL students in preparing students to take academic achievement tests in English. Some might object that because the school's Language Proficiency Assessment Committee has the option of testing an ELL child in Spanish or English, the percentage tested in English in bilingual education is irrelevant. I disagree. It is clear from reading state law and regulations that the purpose of bilingual education is to prepare the child for taking the TAKS in English as soon as possible. Why else the provision for a maximum of three years of Spanish test taking?

Indeed, the only reason a proficiency assessment committee would schedule an ELL child for an exam in Spanish is that the committee thought the child would score higher in Spanish than in English. Any difference between types of ELL programs in English testing rates can be considered an outcome of the program. It can also be considered a systematic "bias" that invalidates a simple assessment of achievement outcomes between programs. That is because the students who would score lowest in English are exempted from testing in English.



Figure 3: % of ELL Students Tested in TAKS Writing & Science Test by % ELL Students in Bilingual Education, Texas Public Schools\* 2006-07



\* Excludes charter and special education schools and schools with <10 ELL students in the grade analyzed.

Note: Figure 3 controls for the % of ELL students in grade and % of poor students in the school.

### TAKS Achievement Scores in English

The state of Texas has a complicated achievement rating system that involves students meeting various performance standards, most of them federally mandated. These data are available at the school, district, and state level as percentages of students in various groups in each grade who meet each of these standards. The idiosyncratic nature of these standards, along with their sheer number, make them less useful for statistical analysis than the more common, nationally used test scores, such as percentiles,\* normal curve equivalents, and scale scores.

Fortunately, the TEA student assessment division web site<sup>†</sup> includes the average scale scores for each grade and test and group. These are the scores used in the analyses that follow.<sup>‡</sup> Appendix 7a, 7b, and 7c show that, as hypothesized above, the *lower* the percentage of ELL students tested in a grade, the *higher* the average reading, math, writing, and science

score in English for ELL students in that grade. This is indisputable evidence that the lower-scoring ELL students are indeed the ones not being tested.

Appendices 8a, 8b, and 8c and Figures 4, 5, and 6 show a solution to removing this bias—weighting<sup>§</sup> the average ELL achievement score in English by the ELL testing rate in English for that subject. Thus, schools with higher ELL testing rates get more credit for their ELL achievement than do those with lower testing rates. Figures 4, 5, and 6 show that bilingual education has a negative effect on reading, math, writing, and science achievement in English. Figure 7 summarizes the path by which this occurs and the outcome. Lower testing rates for ELL students artificially raise ELL achievement, because the lowest scoring students are not tested, as demonstrated in Appendices 7a, 7b, and 7c. When this is taken into account, bilingual education has a negative effect on ELL achievement.

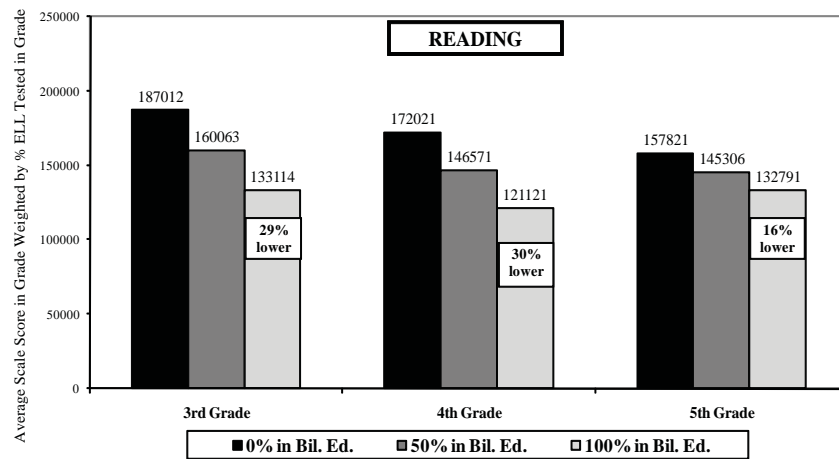
\* Percentiles are not recommended for statistical analysis.

† See <http://www.tea.state.tx.us/student.assessment/reporting/taksagg/download.html>.

‡ A scale score is created from a raw score (number right) by weighting items by their difficulty. On the TAKS, the scale score ranges from approximately 1000 to 3200 for each test.

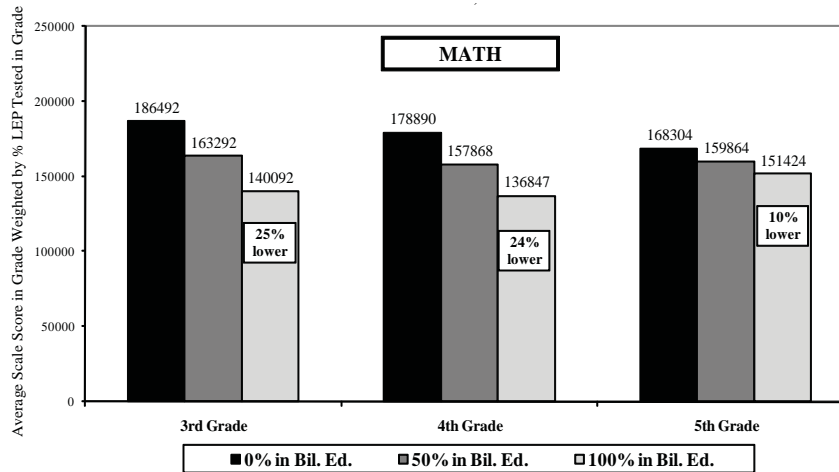
§ To weight means to multiply by some relevant value. In this case, the scale score for ELL students in a grade, test, and school, which ranges from about 1700 to 2700, is multiplied by the percentage of ELL students tested on that test, grade, and school, which ranges from 0 to 100. This produces a weighted scale score for ELL students which ranges from about 10,000 to about 253,000.

Figure 4: Average Weighted TAKS Reading/ELA Scale Scores of ELL Students, Texas Public Schools\* 2006-07



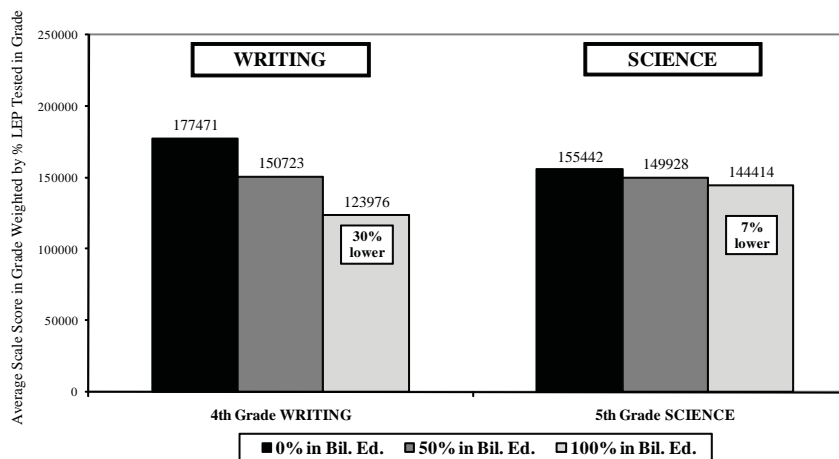
\* Excludes charter and special education schools and schools with less than 10 ELL students in the grade analyzed.

Figure 5: Average Weighted TAKS Math Scale Scores of ELL Students, Texas Public Schools\* 2006-07



\* Excludes charter and special education schools and schools with less than 10 ELL students in the grade analyzed.

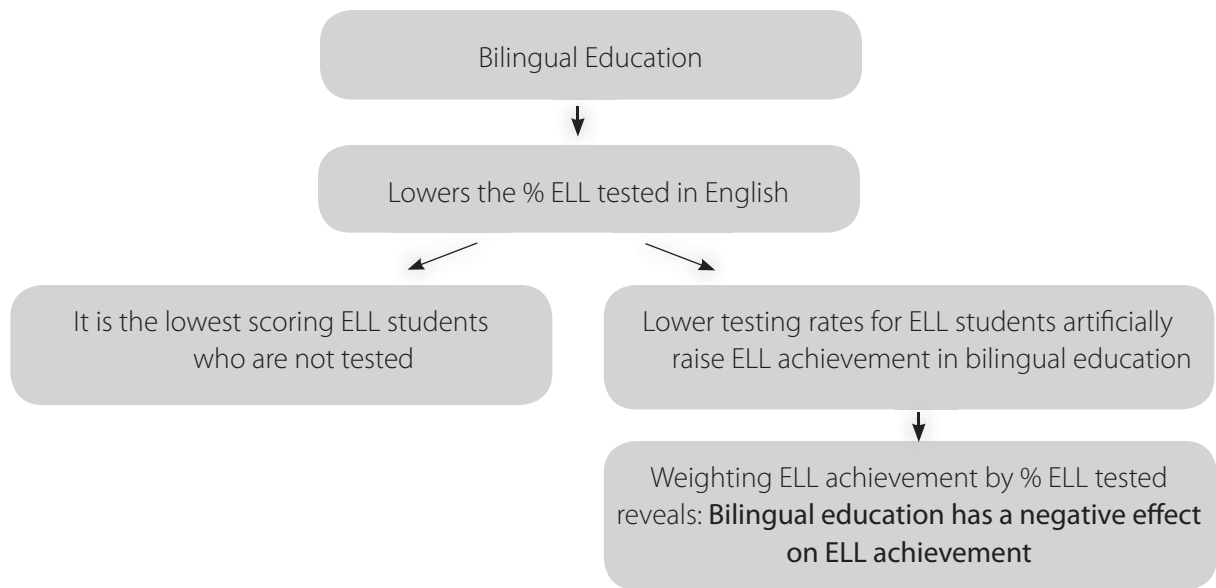
Figure 6: Average Weighted TAKS Writing & Science Scale Scores of ELL Students, Texas Public Schools\* 2006-07



\* Excludes charter and special education schools and schools with less than 10 ELL students in the grade analyzed.

Note: Figures 4,5,6 control for the % of ELL students in grade and % of poor students in the school.

Figure 7: The Relationship between Bilingual Education and ELL Achievement in English



## The Cost of Bilingual Education

### *The Methodology*

The cost of bilingual education cannot be determined by looking at the budget allocation, either nationally or in Texas. The state budget shows \$181,693,445 allocated to “bilingual education” in 2006-07 and \$223,051,856 in 2007-08. This is neither the cost of bilingual education nor the amount of money spent on it by the state. One reason for this is that state law makes no distinction between money spent on bilingual education and money spent on ESL content programs (i.e., sheltered English immersion) or ESL pullout programs. The expenditures labeled “bilingual education” in the state data base are the sum of all expenditures for ELL students.

Even if state law did make a distinction between funding for bilingual education and funding for other programs for ELL students, it would be difficult to determine the *added* cost of bilingual education, in Texas or elsewhere. The total cost, which is typically the only cost made public, is inflated and misleading. That is because it includes the salaries of teachers and the cost of supplies and services that students would receive regardless of what program they were in. The added cost, by contrast, is only that

amount of money spent solely because the ELL child is in a bilingual education program, rather than another type of program. This “added cost” is, of course, always much less than the total cost.

The extensive data on other characteristics of schools that I have either downloaded or acquired by special request allow me to estimate the “added cost” of bilingual education by examining the relationship in a given school between bilingual education enrollment and per-pupil expenditures. This is explained in Appendix 9 and shown as two equations, one for total expenditures per pupil and another for instructional expenditures per pupil, in Appendix 9a.

Figure 8 (next page) shows that in Texas, a school with all its students in bilingual education spends \$402 more per pupil than one with no students in bilingual education. Figure 9 (next page) shows that the first kind of school spends \$211 more for *instruction* per pupil than does the second kind. In short, bilingual education costs more (i.e., has an added cost) than do alternative programs, such as a mainstream classroom with ESL pullout or sheltered English immersion. Other studies have also found that bilingual education costs more than alternative programs for ELL students (\$200 to \$700

Figure 8: Total Per Pupil Expenditures by % of School in Bilingual Education (BE) and % ELL, Texas Elementary Schools\* 2005-06

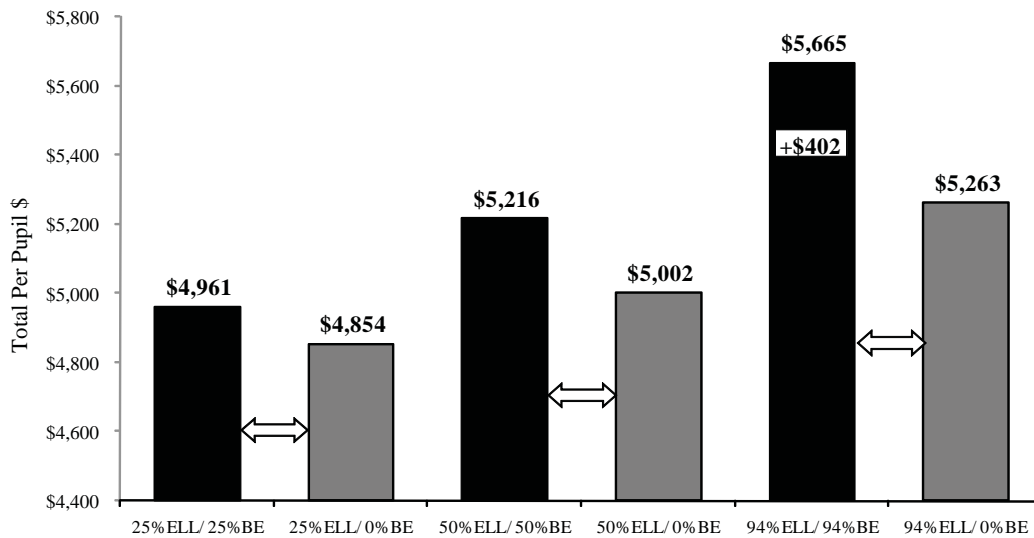
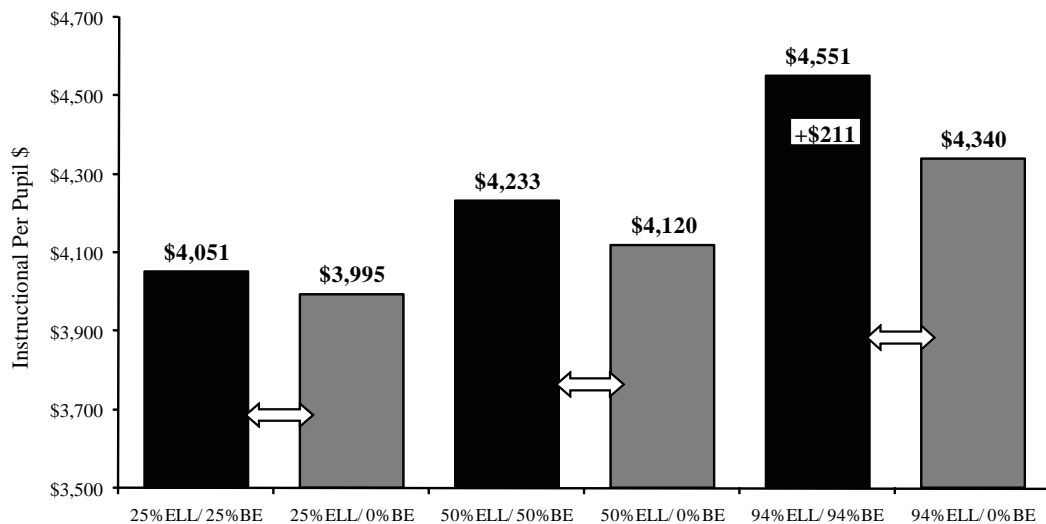


Figure 9: Instructional Per Pupil Expenditures by % of School in Bilingual Education (BE) and % ELL, Texas Elementary Schools\* 2005-06



\*Including only regular schools with at least 80 ELL students.  
 Note: Figures 8 & 9 control for school size, special education, poverty, and % ELL.

more per pupil, according to Carpenter-Huffman and Samulon, 1983; \$205 more per pupil, according to Garcia, 1977; and \$680 more per pupil, according to Prince and Hubert, 1994).

### Conclusion

The data analyzed in this study suggest that bilingual education is the least effective program for ELL students if one's goal is achievement in English.

ELL students in bilingual education are tested in English on the TAKS at significantly lower rates than those students not in bilingual education. This indicates that bilingual education is less effective than all-English programs in teaching ELL students English and subject matter that they will have to know in English. The fact that Texas law allows such a discrepancy does not excuse it.

The statistical analyses presented in this report demonstrate that it is the lowest-scoring students who are not tested in English. The correlation is clear: the lower the testing rate for ELL students, the higher the ELL achievement. The fact that Texas law allows local language proficiency committees to designate a Spanish rather than an English test, or exempt an insufficiently prepared ELL student altogether, does not invalidate a reality, namely, that both possibilities grow likelier if the student is in a bilingual education program rather than an alternative. When more weight is given to ELL TAKS English test scores in schools where ELL students have higher testing rates, bilingual education has a negative effect on achievement in English.

Finally, as noted in every other study of the question, bilingual education in Texas is more expensive than other programs for ELL students. That it is also the least educationally effective suggests that it is not the best program for Texas.

## Recommendations

### *1) Adopt sheltered English immersion as the default assignment for ELL students.*

Given that bilingual education is both more costly and less effective than other programs for ELL students, it is recommended that Texas follow the lead of other states and adopt sheltered English immersion as the default assignment for ELL students. At the very least, Texas should consider giving schools a choice as to the program that elementary ELL students receive, particularly in light of the fact that only three other states mandate bilingual education.

Research indicates that sheltered English immersion is the most successful program for ELL students *if* one's goal is the highest level of achievement in English that a child is capable of (Rossell and Baker, 1996a, 1996b; Bali, 2001; Rossell, 2002; Rossell and Kuder, 2005). A sheltered English immersion course involves second language learners only, taught by a teacher trained in second language acquisition techniques. Instruction is almost entirely in the second language, but at a pace the child can understand.

Sheltered English immersion is mandated as the default assignment for English Language Learners by Proposition 227, passed in June 1998 in California; by Proposition 203, passed in November 2000 in Arizona; and by Question 2, passed in November 2002 in Massachusetts. It is also implemented at the discretion of schools and districts throughout the United States.

My analyses (Rossell, 2002) and those of Bali (2001) of the effectiveness of sheltered English immersion in California show a positive effect on reading and math achievement from dismantling bilingual education in a school. Through teacher and principal interviews (Rossell, 2002) in California in Spring 1999 and Fall 2001, strong support was revealed among teachers and principals for sheltered English immersion, even among those who had lobbied to stop the initiative from passing.

The former bilingual education teachers were now the sheltered English immersion teachers. The ones I talked to, loved it. In their previous experience as bilingual education teachers, they had worried about how much English their students were learning, but did not want to send their students to a mainstream classroom. Now these teachers felt they had the best of all possible worlds—a sheltered classroom in which they could use Spanish when needed to communicate with a parent or new child, but in which almost all of the instruction was in English.

### *2) Parents should be given choice.*

Not every parent of an ELL child wants their child to be in a self-contained classroom consisting only of other ELL students, even if the language of instruction is English. In addition, parents who want their ELL child to be educated in two languages and understand the educational cost should have the right to request an alternative program, including a bilingual education program if demand squares with resources. However, the parent should have to come down to the school and talk to the staff about the programs for ELL students in order to understand exactly what they are and what the benefits and costs are.

One of the more shocking findings in years of talking to parents of ELL children assigned to bilingual education is that, despite being notified of the assignment, the parents had no idea of all its implications. They were unaware their child would be in a classroom in which instruction was at least partly in Spanish: almost completely so in the case of kindergartners. This confusion is undoubtedly a problem in Texas, where the default assignment is bilingual education. Although parents have the authority to opt out of a bilingual education program in Texas (as in every other state with mandated bilingual education), they are more prone to approve than to reject the default assignment made by the school, because they do not understand what their child is being assigned to and assume the educational experts know best (Rossell, 2002). Thus, it is important to make the default assignment the program that is the most effective—sheltered English immersion—and not the one that is least effective—bilingual education. Then parents can become educated about the programs before they switch their child.

### **3) *All ELL students must be tested on the English TAKS.***

This is the most effective way to hold schools accountable for the English language acquisition of their ELL students. Interestingly, it is also an excellent way to give schools credit for the extraordinary job they do of teaching English and subject matter in English to non-English speaking students. If a school or district tests ELL students only in English on the state proficiency tests many years after their arrival, they miss out on being given credit for the gains in English that ELL children made in the years before that.

Universal testing of ELL students on the state proficiency tests in English is required in California, so it is possible to do this. English language proficiency tests designed solely for ELL students—the Texas English Language Proficiency Assessment System (TELPAS)\*—are not a substitute for the state proficiency test, as one cannot compare the scores for, and the gains in, a test taken only by ELL students to the scores on a different test taken by non-ELL students.

The above recommendations are based on empirical research nationally and in Texas. Instruction in English (and the elimination of bilingual education) is overwhelmingly supported by the public, according to a number of national surveys (see Rossell and Baker, 1996; Gallup, 1998; Gallup, 2005) and by voters in three states (California in 1998, Arizona in 2000, and Massachusetts in 2002).

A large majority of immigrant parents want their children taught in English, not the native tongue (see Rossell and Baker, 1996a). Sheltered English immersion has already been adopted and accepted in California, Arizona, and Massachusetts—all states with large Spanish-speaking immigrant populations—as a more effective method of teaching English to English language learners.<sup>†</sup> The Texas Legislature should consider embracing sheltered English immersion as the default program in place of bilingual education. ★

\* See [http://ritter.tea.state.tx.us/student.assessment/resources/guides/test\\_admin/2009/TELPAS\\_Manual\\_2009.pdf](http://ritter.tea.state.tx.us/student.assessment/resources/guides/test_admin/2009/TELPAS_Manual_2009.pdf).

† Sheltered English Immersion was not adopted in Colorado when it was put to a vote of the electorate because a) it meant a change to the state constitution, which is harder to get, and b) there was already considerable flexibility in the Colorado education code—that is, bilingual education was an option, but not mandated—so a change to the constitution seemed unnecessary to many.

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Appendix 1: State LEP Populations Served by Federal Bilingual Education (Title III), 2005-06

Alphabetical List of States	LEP Title III, 2005-06	% LEP of PK-12		States Ranked by Size of Title III LEP Population, 2005-06	States Ranked by % LEP of PK-12 Student Enrollment, 2005-06		
		Student Enrollment, 2005-06	Total Enrollment, 2005-06				
U.S. Total	4,222,849	9%	48,912,085	U.S. Total	4,222,849	U.S. Total	9%
U.S. Mean	82,801	9%	959,060	U.S. Mean	82,801	U.S. Mean	9%
U.S. Median	25,767	4%	641,685	U.S. Median	25,767	U.S. Median	4%
Alabama	15,088	2%	741,547	California	1,565,675	California	24.8%
Alaska	18,475	14%	133,292	<b>Texas</b>	<b>638,863</b>	New Mexico	19.5%
Arizona	152,568	14%	1,094,454	Florida	242,343	Nevada	17.9%
Arkansas	17,723	4%	474,206	New York	229,470	<b>Texas</b>	<b>14.1%</b>
California	1,565,675	25%	6,312,103	Illinois	155,810	Arizona	14.0%
Colorado	83,709	11%	779,826	Arizona	152,568	Alaska	13.9%
Connecticut	27,216	5%	575,058	Colorado	83,709	Colorado	10.7%
Delaware	6,015	5%	120,937	North Carolina	83,010	Utah	10.3%
D.C.	3,843	5%	76,876	Nevada	74,009	Florida	9.1%
Florida	242,343	9%	2,675,024	Washington	73,499	Hawaii	8.8%
Georgia	56,465	4%	1,598,461	Michigan	65,419	New York	8.1%
Hawaii	16,190	9%	184,925	New Mexico	63,650	Illinois	7.4%
Idaho	18,884	7%	261,844	Georgia	56,465	Idaho	7.2%
Illinois	155,810	7%	2,111,706	Minnesota	55,531	Washington	7.1%
Indiana	33,942	3%	1,034,782	Utah	52,582	Minnesota	6.6%
Iowa	14,742	3%	481,099	New Jersey	52,285	Rhode Island	6.6%
Kansas	25,767	6%	466,266	Massachusetts	43,820	Oregon	6.5%
Kentucky	10,043	2%	641,685	Virginia	39,862	North Carolina	5.9%
Louisiana	7,317	1%	654,397	Pennsylvania	37,268	Kansas	5.5%
Maine	2,726	1%	195,498	Oregon	34,803	D.C.	5.0%
Maryland	29,778	3%	860,020	Indiana	33,942	Delaware	5.0%
Massachusetts	43,820	5%	971,909	Wisconsin	31,802	Connecticut	4.7%
Michigan	65,419	4%	1,711,544	Maryland	29,778	Oklahoma	4.7%
Minnesota	55,531	7%	839,084	Oklahoma	29,564	Massachusetts	4.5%
Mississippi	3,611	1%	494,954	Connecticut	27,216	Michigan	3.8%
Missouri	15,559	2%	915,850	Kansas	25,767	New Jersey	3.7%
Montana	3,582	2%	145,416	Ohio	21,257	Arkansas	3.7%
Nebraska	8,839	3%	286,646	South Carolina	19,540	Wisconsin	3.6%
Nevada	74,009	18%	412,407	Idaho	18,884	Georgia	3.5%
New Hampshire	3,532	2%	205,767	Tennessee	18,671	Maryland	3.5%
New Jersey	52,285	4%	1,395,602	Alaska	18,475	Virginia	3.3%
New Mexico	63,650	19%	326,758	Arkansas	17,723	Indiana	3.3%
New York	229,470	8%	2,838,209	Hawaii	16,190	Nebraska	3.1%
North Carolina	83,010	6%	1,416,436	Missouri	15,559	Iowa	3.1%
North Dakota	2,684	3%	98,284	Alabama	15,088	South Carolina	2.8%
Ohio	21,257	1%	1,836,991	Iowa	14,742	North Dakota	2.7%
Oklahoma	29,564	5%	634,739	Kentucky	10,043	Montana	2.5%
Oregon	34,803	7%	534,823	Rhode Island	10,000	South Dakota	2.2%
Pennsylvania	37,268	2%	1,828,287	Nebraska	8,839	Pennsylvania	2.0%
Rhode Island	10,000	7%	151,690	Louisiana	7,317	Alabama	2.0%

Alphabetical List of States	LEP Title III, 2005-06	% LEP of PK-12 Student Enrollment, 2005-06	Total Enrollment, 2005-06	States Ranked by Size of Title III LEP Population, 2005-06	States Ranked by % LEP of PK-12 Student Enrollment, 2005-06		
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U.S. Mean	82,801	9%	959,060	U.S. Mean	82,801	U.S. Mean	9%
U.S. Median	25,767	4%	641,685	U.S. Median	25,767	U.S. Median	4%
South Carolina	19,540	3%	701,544	Delaware	6,015	Tennessee	2.0%
South Dakota	2,649	2%	122,008	D.C.	3,843	New Hampshire	1.7%
Tennessee	18,671	2%	953,798	Mississippi	3,611	Missouri	1.7%
Texas	638,863	14%	4,523,873	Montana	3,582	Kentucky	1.6%
Utah	52,582	10%	508,430	New Hampshire	3,532	Maine	1.4%
Vermont	1,216	1%	96,638	Maine	2,726	Vermont	1.3%
Virginia	39,862	3%	1,214,229	North Dakota	2,684	Ohio	1.2%
Washington	73,499	7%	1,031,985	South Dakota	2,649	Louisiana	1.1%
West Virginia	1,140	0%	280,703	Vermont	1,216	Wyoming	1.0%
Wisconsin	31,802	4%	875,066	West Virginia	1,140	Mississippi	0.7%
Wyoming	813	1%	84,409	Wyoming	813	West Virginia	0.4%

Sources: 1) Biennial Evaluation Report to Congress on the Implementation of Title III, Evaluation Element 3; and 2) National Center for Educational Statistics/Common Core of Data Public Elementary and Secondary Students, Staff, Schools, and School Districts: School Year 2005-06.

**Appendix 2: Trends in the Student Population by Race/Ethnicity and ELL Status, Texas Public Schools, 1992-2007**

	Total	Hispanic	Asian	White	Black	Nat. Am.	% Hispanic	% Non-White	ELL	Hispanic ELL	% of Hispanics who are ELL	% Non-Hispanics who are ELL
Change	1,035,162	875,900	73,117	-76,226	155,075	7,296	11%	13%	332,527	309,319	2%	1%
2006-07	4,576,933	2,118,867	149,817	1,631,680	660,785	15,784	46%	64%	731,304	679,821	32%	2%
2005-06	4,505,572	2,040,449	141,589	1,644,308	664,242	14,984	45%	64%	711,237	661,768	32%	2%
2004-05	4,383,871	1,961,549	133,010	1,653,008	621,999	14,305	45%	62%	684,007	637,142	32%	2%
2003-04	4,311,502	1,886,319	126,875	1,669,842	614,714	13,752	44%	61%	660,308	615,281	33%	2%
2002-03	4,239,911	1,811,882	122,229	1,686,534	606,141	13,125	43%	60%	630,148	585,809	32%	2%
2001-02	4,160,968	1,734,388	116,222	1,700,622	596,962	12,774	42%	59%	601,448	558,694	32%	2%
2000-01	4,071,433	1,650,560	108,605	1,713,436	586,712	12,120	41%	58%	570,603	530,376	32%	2%
1999-00	4,002,227	1,582,538	103,686	1,727,733	576,977	11,293	40%	57%	555,470	516,601	33%	2%
1998-99	3,954,434	1,526,713	100,143	1,746,896	568,757	11,925	39%	56%	533,805	496,790	33%	2%
1997-98	3,900,488	1,478,984	95,136	1,755,385	560,405	10,578	38%	55%	519,921	483,320	33%	2%
1996-97	3,837,096	1,435,521	91,051	1,750,930	549,667	9,927	37%	54%	514,263	479,359	33%	1%
1995-96	3,799,032	1,397,109	88,264	1,756,966	546,861	9,832	37%	54%	479,576	447,174	32%	1%
1994-95	3,730,544	1,347,613	84,933	1,750,213	538,742	9,043	36%	53%	455,331	422,698	31%	1%
1993-94	3,672,198	1,310,267	82,107	1,742,151	529,285	8,388	36%	53%	426,059	396,437	30%	1%
1992-93	3,541,771	1,242,967	76,700	1,707,906	505,710	8,488	35%	52%	398,777	370,502	30%	1%

Source: Texas Education Agency

**Appendix 3: Trends in Bilingual Enrollment and ELL Population, Texas Public Schools, 1992-2007**

	Bilingual Education Enrollment							ELL Population							% ELL in Bilingual Education		
	Nat. Am.	Asian/ Pl.	Afr. Am.	Hisp.	White	Total	% Hisp.	Nat. Am.	Asian/ Pl.	Afric. Am.	Hisp.	White	Total	% Hisp.	% All ELL	% Hisp. ELL	% Non-Hisp. ELL
<b>Change</b>	97%	-10%	69%	104%	-16%	101%	1.5%	46%	67%	354%	83%	80%	84%	-0.1%	5%	6%	-10%
2006-07	203	777	458	393,864	1,049	396,351	99%	530	34,918	7,135	679,821	9,375	731,779	93%	54%	58%	5%
2005-06	185	755	379	375,038	888	377,245	99%	523	33,350	6,555	661,768	9,059	711,255	93%	53%	57%	4%
2004-05	178	664	359	355,062	951	357,214	99%	547	31,717	5,856	637,142	8,810	684,072	93%	52%	56%	5%
2003-04	145	723	268	336,646	960	338,742	99%	487	30,733	4,948	615,281	9,143	660,592	93%	51%	55%	5%
2002-03	157	804	337	320,027	1,137	322,462	99%	513	29,937	4,575	585,809	9,352	630,186	93%	51%	55%	5%
2001-02	194	777	309	303,383	1,097	305,760	99%	578	28,560	4,205	558,694	9,197	601,234	93%	51%	54%	6%
2000-01	183	701	242	283,650	1,010	285,786	99%	541	26,832	3,742	530,376	8,952	570,443	93%	50%	53%	5%
1999-00	175	700	226	274,849	1,038	276,988	99%	537	26,471	3,214	516,601	8,497	555,320	93%	50%	53%	6%
1998-99	175	662	284	267,435	994	269,550	99%	534	25,507	3,028	496,790	7,753	533,612	93%	51%	54%	6%
1997-98	163	673	290	260,126	991	262,243	99%	508	25,807	2,828	483,320	7,289	519,752	93%	50%	54%	6%
1996-97	152	775	288	251,676	1,056	253,947	99%	473	24,543	2,648	479,359	6,990	514,013	93%	49%	53%	7%
1995-96	133	763	320	239,076	1,067	241,359	99%	494	23,253	2,197	447,174	6,229	479,347	93%	50%	53%	7%
1994-95	127	1,102	255	225,006	1,106	227,596	99%	455	23,991	1,896	422,698	6,065	455,105	93%	50%	53%	8%
1993-94	112	862	201	207,677	1,012	209,864	99%	392	21,851	1,643	396,437	5,543	425,866	93%	49%	52%	7%
1992-93	103	2,525	271	193,471	1,255	197,625	98%	363	20,872	1,570	370,502	5,204	398,511	93%	50%	52%	15%

\*Note: To avoid the erratic data in 1992-93, the change for Asians is calculated from 1993-94 to 2006-07. Source: Texas Education Agency

**Appendix 4: % ELL and Bilingual Education by Grade,\* Texas Public Schools, 2006-07**

Grade	Total		% of Total		% of ELL in Bilingual Education
	ELL	Bilingual Education	ELL	Bilingual Education	
EE	606	258	0.1%	0.1%	42.5%
PK	78,999	59,790	10.7%	15.1%	75.7%
KG	96,076	69,872	13.0%	17.6%	72.7%
1	100,637	71,299	13.7%	18.0%	70.8%
2	92,665	63,564	12.6%	16.0%	68.6%
3	84,919	56,748	11.5%	14.3%	66.8%
4	59,329	39,592	8.1%	10.0%	66.7%
5	47,970	29,917	6.5%	7.5%	62.4%
6	34,765	5,363	4.7%	1.4%	15.4%
7	27,854	247	3.8%	0.1%	0.9%
8	29,553	148	4.0%	0.0%	0.5%
9	35,770	54	4.9%	0.0%	0.2%
10	20,851	34	2.8%	0.0%	0.2%
11	15,053	34	2.0%	0.0%	0.2%
12	11,662	31	1.6%	0.0%	0.3%
<b>Total</b>	<b>736,707</b>	<b>396,951</b>	<b>100%</b>	<b>100%</b>	<b>53.9%</b>

\*Note: These and other enrollment data will vary slightly because one unfortunate decision made by someone in the Texas Education Agency is to not only mask student achievement outcomes where there are 1-4 students of a group in a school in records made available to the public, but also to mask the number of students in that group if there are 1-4. The only legal requirement of FERPA (Family Education Right to Privacy Act), however, is to mask the outcomes. Indeed, since -999 in the Texas data base means that the number of students in that group is 1, 2, 3, or 4, the anonymity of the group is not protected since one knows the number is either 1, 2, 3, or 4. Masking the outcome is sensible since one has no way of knowing what that is as it could vary tremendously. I was, however, unable to persuade the one bureaucrat I communicated with of the foolishness of the rule of "masking" a small group's size when one knows that it is 1, 2, 3, or 4. This is hardly "masking" and it is completely unnecessary since the outcomes for these groups are masked. Since I was unable to get the actual number in a group for schools that have -999, I chose the midpoint between 1-4 which is 2.5. All schools with 2.5 in actuality have anywhere from 1-4 in a group. These data points were only used for the descriptive tables, not for any statistical analysis.

Source: Texas Education Agency

Appendix 5: % of Students Tested in English TAKS Tests Grades 3-11, Texas Public Schools, 2006-07\*

Grade	Reading			Math			Writing			Social Studies			Science		
	% ELL Tested	% Non-ELL Tested	% All Students Tested	% ELL Tested	% Non-ELL Tested	% All Students Tested	% ELL Tested	% Non-ELL Tested	% All Students Tested	% ELL Tested	% Non-ELL Tested	% All Students Tested	% ELL Tested	% Non-ELL Tested	% All Students Tested
3	59%	93%	85%	62%	93%	86%									
4	58%	92%	86%	63%	92%	88%	55%	89%	84%						
5	66%	91%	88%	71%	92%	89%							71%	91%	88%
6	68%	92%	89%	70%	92%	90%									
7	59%	92%	89%	60%	92%	89%	57%	90%	87%						
8	49%	69%	67%	49%	68%	67%				48%	68%	66%	49%	68%	67%
9	57%	88%	85%	57%	87%	85%									
10	61%	90%	88%	61%	88%	87%									
11	67%	86%	85%	66%	85%	84%				65%	86%	85%	66%	85%	84%
<b>Total</b>	<b>60%</b>	<b>88%</b>	<b>85%</b>	<b>63%</b>	<b>78%</b>	<b>65%</b>	<b>56%</b>	<b>90%</b>	<b>85%</b>	<b>54%</b>	<b>76%</b>	<b>75%</b>	<b>63%</b>	<b>81%</b>	<b>79%</b>

\*Note: Charter and special education schools excluded. Source: Texas Education Agency

Appendix 6: Technical Note on Solving Equations

Appendix 6a, 6b, 6c shows multiple regression equations, one for each elementary grade (3, 4, 5) and one for each test (reading, math, writing, and science). These equations explain the causes of variation in the percentage of ELL students tested on the TAKS in English at each grade (the dependent variable) for regular elementary schools (excluding special education, alternative, and charter schools) and schools with enough ELL students in a grade (10) to actually make it fiscally feasible to have a bilingual education program by combining two grades. The explanatory variables (aka the independent variables) are the percentage of ELL students in that grade enrolled in bilingual education, the percentage poor in the school, and the percentage ELL of that grade. In order to know the independent effect of bilingual education on the percentage of ELL tested, one must control for the percentage ELL in a grade. Since ELL students, and ELL students enrolled in bilingual education, tend to be poorer than others and poor students have relatively high absentee rates and mobility rates, we would want to control for that as well in order to know the independent effect of bilingual education on the percentage of ELL tested.

In the following tables, the column labeled “b” shows the change in the percentage tested for a one unit change in the independent variable. The column labeled “Beta” shows the relative importance of the independent variable compared to the other independent variables. The column labeled “Sig.” is the statistical significance of the variable. If the significance level is .000, this means that the relationship could not have happened by chance. If the significance level is .05 or less, the relationship could have happened by chance only 5 or less times out of 100. If the significance level is between .05 and .10, the relationship could have happened by chance only 10 times or less out of 100.

To mathematically solve the equation for 0, 50, and 100 percent ELL enrolled in bilingual education in a grade and school, I multiplied the mean (average) percentage poor in a school and the mean percentage ELL in a grade by their b coefficient and added those sums to the constant. Then I multiplied 0, 50, and 100 percentage ELL in a grade enrolled in bilingual education by its b coefficient and added that sum to the previous sum. This is the predicted percentage of ELL students tested for those percentages enrolled in bilingual education in a grade.

**Appendix 6a: Social and Program Characteristics that Affect the % of ELL Students Tested on TAKS English Reading, Texas Public Schools,\* 2006-07**

Dependent Variable	3rd Grade					4th Grade					5th Grade				
	Avg.	b	Std. Error	Beta	Sig.	Avg.	b	Std. Error	Beta	Sig.	Avg.	b	Std. Error	Beta	Sig.
% ELL Tested in Grade	60.9					57.1					62.3				
<b>Independent Variables</b>															
% ELL in BE in Grade	61.2	<b>-0.397</b>	.018	-.49	a 0.000	67.0	<b>-0.326</b>	.018	-.43	a 0.000	64.2	<b>-0.137</b>	.016	-.234	a 0.000
% Poor in School	73.7	-.160	.034	-.12	a 0.000	77.8	.032	.040	.02	0.425	78.5	.012	.036	.010	a 0.743
% ELL in Grade	37.7	.055	.035	.04	0.119	32.9	-.109	.042	-.07	a 0.009	28.2	-.008	.042	-.006	0.849
Constant		94.998	1.947		a 0.000		79.999	2.561		a 0.000		70.362	2.476		a 0.000
Adjusted R <sup>2</sup>		.290					.201					0.052			
Number of Schools		2,103					1,625					1,418			

**Appendix 6b: Social and Program Characteristics that Affect the % of ELL Students Tested on TAKS English Math, Texas Public Schools, 2006-07**

Dependent Variable	3rd Grade					4th Grade					5th Grade				
	Avg.	b	Std. Error	Beta	Sig.	Avg.	b	Std. Error	Beta	Sig.	Avg.	b	Std. Error	Beta	Sig.
% ELL Tested in Grade	63.7					62.1					67.4				
<b>Independent Variables</b>															
% ELL in BE in Grade	61.2	<b>-0.369</b>	0.019	-0.45	a 0.000	67.0	<b>-0.284</b>	0.019	-0.38	a 0.000	64.2	<b>-0.093</b>	0.015	-0.17	a 0.000
% Poor in School	73.7	-0.198	0.035	-0.14	a 0.000	77.8	0.018	0.040	0.01	0.651	78.5	-0.006	0.035	-0.01	0.860
% ELL in Grade	37.7	0.133	0.036	0.09	a 0.000	32.9	-0.097	0.042	-0.06	a 0.022	28.2	0.032	0.040	0.03	0.430
Constant		95.765	2.020		a 0.000		82.944	2.600		a 0.000		72.933	2.357		a 0.000
Adjusted R <sup>2</sup>		0.242					0.159					0.025			
Number of Schools		2,103					1,625					1,418			

**Appendix 6c: Social and Program Characteristics that Affect the % of ELL Students Tested on TAKS English Writing & Science, Texas Public Schools,\* 2006-07**

Dependent Variable	4th Grade Writing					5th Grade Science				
	Avg.	b	Std. Error	Beta	Sig.	Avg.	b	Std. Error	Beta	Sig.
% ELL Tested in Grade	54.8					66.9				
<b>Independent Variables</b>										
% ELL in BE in Grade	67.0	<b>-0.348</b>	0.019	-0.45	a 0.000	64.2	<b>-0.056</b>	0.016	-0.10	a 0.000
% Poor in School	77.8	0.028	0.041	0.02	0.495	78.5	-0.016	0.036	-0.01	0.656
% ELL in Grade	32.9	-0.100	0.043	-0.06	a 0.019	28.2	0.052	0.042	0.04	0.211
Constant		79.194	2.615		a 0.000		70.344	2.434		a 0.000
Adjusted R <sup>2</sup>		0.213					0.007			
Number of Schools		1,625					1,418			

Notes for Appendices 6a-6c: <sup>a</sup> Statistically significant at .05 or better.  
 \*Selecting only regular schools (excluding charter, X, Alt. 1, 2, 3) and selecting schools with ELL in grade >=10.

**Appendix 7a: Social and Program Characteristics Affecting the Average Scale Score of ELL Students on TAKS English Reading, Texas Public Schools,\* 2006-07**

Dependent Variable	3rd Grade					4th Grade					5th Grade				
	Avg.	b	Std. Error	Beta	Sig.	Avg.	b	Std. Error	Beta	Sig.	Avg.	b	Std. Error	Beta	Sig.
Reading/ELA	2241					2152					2119				
<b>Independent Variables</b>															
% ELL in BE in Grade	57.5	<b>0.061</b>	.048	.04	.203	64.5	<b>0.036</b>	.056	.02	.523	63.9	<b>0.163</b>	.053	.09	a .002
% Poor in School	72.5	-1.128	.084	-.39	a .000	77.4	-1.135	.113	-.32	a .000	78.9	-1.189	.118	-.32	a .000
% ELL in Grade	37.8	0.184	.090	.06	a .041	32.8	0.719	.120	.19	a .000	28.6	0.853	.135	.21	a .000
% ELL Tested in Grade	67.6	<b>-0.436</b>	.064	-.17	a .000	62.9	<b>-0.405</b>	.084	-.14	a .000	65.0	<b>-0.270</b>	.097	-.08	a .005
Constant		2342	7.540		a .000		2240	9.934		a .000		2195	10.910		a .000
Adjusted R <sup>2</sup>		0.115					0.080					.081			
Number of Schools		1,866					1,442					1,333			

**Appendix 7b: Social and Program Characteristics Affecting the Average Scale Score of ELL Students on TAKS English Math, Texas Public Schools,\* 2006-07**

Dependent Variable	3rd Grade					4th Grade					5th Grade				
	Avg.	b	Std. Error	Beta	Sig.	Avg.	b	Std. Error	Beta	Sig.	Avg.	b	Std. Error	Beta	Sig.
Math	2215					2204					2212				
<b>Independent Variables</b>															
% ELL in BE in Grade	57.7	<b>0.136</b>	.061	.06	a .027	64.9	<b>.206</b>	.066	.09	a .002	64.1	<b>.449</b>	.068	.19	a .000
% Poor in School	72.5	-1.370	.109	-.38	a .000	77.5	-1.198	.136	-.28	a .000	78.9	-.900	.153	-.19	a .000
% ELL in Grade	37.9	0.473	.116	.13	a .000	32.8	.611	.142	.14	a .000	28.6	.784	.175	.15	a .000
% ELL Tested in Grade	70.3	<b>-0.345</b>	.080	-.11	a .000	67.3	<b>-0.437</b>	.100	-.12	a .000	69.3	<b>-.140</b>	.130	-.03	.281
Constant		2313	9.578		a .000		2293	12.065		a .000		2242	14.621		a .000
Adjusted R <sup>2</sup>		.085					.065					.059			
Number of Schools		1,878					1,476					1,360			

**Appendix 7c: Social and Program Characteristics Affecting the Average Scale Score of ELL Students on TAKS English Writing & Science, Texas Public Schools,\* 2006-07**

Dependent Variable	4th Grade Writing					5th Grade Science				
	Avg.	b	Std. Error	Beta	Sig.	Avg.	b	Std. Error	Beta	Sig.
Writing & Science	2255					2089				
<b>Independent Variables</b>										
% ELL in BE in Grade	63.7	<b>.009</b>	.064	.00	.891	64.5	<b>.196</b>	.080	.07	a .014
% Poor in School	77.2	-1.095	.131	-.28	a .000	79.0	-1.035	.180	-.19	a .000
% ELL in Grade	32.9	.893	.139	.21	a .000	28.8	1.156	.204	.19	a .000
% ELL Tested in Grade	61.8	<b>-.267</b>	.095	-.08	a .005	69.4	<b>-.348</b>	.150	-.06	a .021
Constant		2327	11		a .000		2149	17		a .000
Adjusted R <sup>2</sup>		.056					.039			
Number of Schools		1,403					1,344			

Notes for Appendices 7a-7c: <sup>a</sup> Statistically significant at .05 or better.  
 \*Selecting only regular schools (excluding charter, X, Alt. 1, 2, 3) and selecting schools with ELL in grade >=10.

**Appendix 8a: Social and Program Characteristics that Affect the Weighted Average Scale Score of ELL Students Tested on TAKS English Reading, Texas Public Schools,\* 2006-07**

Dependent Variable	3rd Grade					4th Grade					5th Grade				
	Avg.	b	Std. Error	Beta	Sig.	Avg.	b	Std. Error	Beta	Sig.	Avg.	b	Std. Error	Beta	Sig.
Reading/ELA	160569					143158					143480				
<b>Independent Variables</b>															
% ELL in BE in Grade	49.1	<b>-539</b>	32	-0.39	a 0.000	56.7	<b>-509</b>	30	-0.41	a 0.000	57.3	<b>-250</b>	28	-0.24	a 0.000
% Poor in School	67.8	-97	53	-0.04	b 0.071	73.5	-23	61	-0.01	0.707	75.7	-69	58	-0.03	0.239
% ELL in Grade	32.9	-509	63	-0.21	a 0.000	28.9	-423	71	-0.16	a 0.000	25.6	-319	74	-0.13	a 0.000
Constant		210270	2808		a 0.000		185955	3605		a 0.000		171165	3723		a 0.000
Adjusted R <sup>2</sup>		0.326					0.261					0.115			
Number of Schools		2,260					1,726					1,587			

**Appendix 8b: Social and Program Characteristics that Affect the Weighted Average Scale Score of ELL Students Tested on TAKS English Math, Texas Public Schools,\* 2006-07**

Dependent Variable	3rd Grade					4th Grade					5th Grade				
	Avg.	b	Std. Error	Beta	Sig.	Avg.	b	Std. Error	Beta	Sig.	Avg.	b	Std. Error	Beta	Sig.
Math	163662					154904					158601				
<b>Independent Variables</b>															
% ELL in BE in Grade	49.2	<b>-464</b>	32	-0.35	a 0.000	57.051	<b>-420</b>	31	-0.35	a 0.000	57.5	<b>-169</b>	28	-0.17	a 0.000
% Poor in School	67.8	-165	54	-0.08	a 0.002	73.611	-42	62	-0.02	0.500	75.6	-148	58	-0.08	a 0.010
% ELL in Grade	32.9	-346	64	-0.14	a 0.000	28.869	-374	72	-0.14	a 0.000	25.4	-178	74	-0.07	a 0.017
Constant		209046	2853		a 0.000		192745	3654		a 0.000		184035	3692		a 0.000
Adjusted R <sup>2</sup>		0.253					0.195					0.064			
Number of Schools		2,275					1,770					1,627			

**Appendix 8c: Social and Program Characteristics Affecting the Weighted Scale Score of ELL Students on TAKS English Writing & Science, Texas Public Schools,\* 2006-07**

Dependent Variable	4th Grade Writing					5th Grade Science				
	Avg.	b	Std. Error	Beta	Sig.	Avg.	b	Std. Error	Beta	Sig.
Writing & Science	147433					148991				
<b>Independent Variables</b>										
% ELL in BE in Grade	56.2	<b>-535</b>	33	-0.40	a 0.000	58.5	<b>-110</b>	27	-0.11	a 0.000
% Poor in School	73.5	26	78	0.01	0.694	76.3	-125	57	-0.07	a 0.028
% ELL in Grade	29.1	-496	67	-0.18	a 0.000	25.8	-168	71	-0.07	a 0.018
Constant		189960	3958		a 0.000		169331	3698		a 0.000
Adjusted R <sup>2</sup>		.26					0.039			
Number of Schools		1,673					1,587			

Notes for Appendices 8a-8c: <sup>a</sup> Statistically significant at .05 or better. <sup>b</sup> Statistically significant at .10 or better.  
 \*Selecting only regular schools (excluding charter, X, Alt. 1, 2, 3) and selecting schools with ELL in grade >=10.



### Appendix 9: Technical Note on Estimating the Cost of Bilingual Education in Texas

Appendix 9a shows the relationship between the percentage of an elementary school enrolled in bilingual education and the total and instructional expenditures of a school in regular public schools (excluding charter and special education schools) with at least 80 ELL students (the equivalent of 10 per grade PK-6) in 2005-06, the latest year available as of the writing of this report. As expected, size is negatively related to both total and instructional expenditures because of economies of scale. In addition, the percentage of students who are special education is far and away the biggest predictor of expenditures because the state funding weight given to special education is far greater than the other categories, including bilingual/ESL.

The percentage ELL of a school is a stronger predictor of total and instructional expenditures than is the percentage of the school enrolled in bilingual education. This is not surprising since the funding legislation includes all programs for ELL students, not just bilingual education. Since the dependent variable is school, not grade, expenditures, the percentage of the school enrolled in bilingual education seemed to be a better explanatory variable than the percentage of the ELL population in a grade enrolled in bilingual education, used in earlier analyses that had outcome data by grade.

#### Appendix 9a: Social and Program Characteristics that Affect the Per Pupil Expenditures, Texas Elementary Schools,\* 2005-06

Dependent Variable	Total Expenditures					Instructional Expenditures				
	Avg.	b	Std. Error	Beta	Sig.	Avg.	b	Std. Error	Beta	Sig.
Total Per Pupil Expenditures	5062					4130				
<b>Independent Variables</b>										
Total Enrollment of School	655	-1.757	.073	-.468	a .000	655	-1.174	.060	-.403	a .000
% Special Education of School	9.0	78.586	5.118	.302	a .000	9.0	61.300	4.210	.303	a .000
% Poor in School	76.8	.088	.858	.002	.919	76.8	-.209	.706	-.008	.767
% of School in Bilingual Education	29.3	<b>4.284</b>	1.566	.120	a .006	29.3	<b>2.246</b>	1.288	.081	b .081
% ELL of School	38.9	5.918	1.769	.148	a .001	38.9	5.001	1.455	.161	a .001
Constant		5143	103.04		a .000		4103	84.765		a .000
Adjusted R <sup>2</sup>		.379					.304			
Number of Schools		1,784					1,784			

Notes for Appendix 9a: <sup>a</sup> Statistically significant at .05 or better. <sup>b</sup> Statistically significant at .10 or better.  
 \*Selecting only regular schools (excluding charter, X, Alt. 1, 2, 3) and selecting schools with ELL in grade  $\geq 80$ .

## About the Author

**Christine Rossell, Ph.D.** holds the Maxwell Chair in United States Citizenship and is the former chairman of the Political Science Department at Boston University. Her research interests include bilingual education, school desegregation, and educational policy. She has been conducting research and writing on school desegregation for more than 34 years and on bilingual education for more than 29 years.

Dr. Rossell has written five books. Her most recent book on bilingual education, co-authored with Keith Baker is *Bilingual Education in Massachusetts*, published in 1996 by Pioneer Institute of Boston. Her most recent book on school desegregation, *School Desegregation in the 21st Century*, co-edited with David Armor and Herbert Walberg, was published in 2002 by Praeger. She has published numerous articles, book chapters, and technical reports on school desegregation, bilingual education, and other educational issues for numerous journals and for research organizations such as the Lexington Institute, the Wissenschaftszentrum Berlin für Sozialforschung (WZB), the Rand Corporation, American Institutes for Research, and for the U.S. Government, several states, and many school districts throughout the U.S.

Dr. Rossell has been a consultant to and/or expert witness in more than 60 educational equity court cases, and has helped design and defend 11 magnet-voluntary desegregation plans. In addition, she has designed and conducted numerous public opinion surveys.

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