

**Teacher Turnover and Shortages of Qualified Teachers in Texas Public School Districts
2001-2004**

Report to the Senate Education Committee

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Teacher Turnover and Shortages of Qualified Teachers

Numerous reports have indicated that there are, or will be, significant shortages of qualified teachers in Texas. Socioeconomic trends such as increasing student enrollments, large numbers of teacher retirements, and fewer individuals entering teaching have been expected to create an inadequate supply of qualified teachers. While some of the more extreme predictions have not been borne out, there do appear to be shortages of qualified teachers in some districts. New requirements from the No Child Left Behind Act to place “highly qualified” teachers in all core subjects (which make up the majority of the K-12 curriculum) increase the need to recruit and retain qualified teachers.

Questions about teacher shortages lead to questions about teacher attrition, as high rates of attrition are thought to be a greater influence on shortages than inadequate supplies of new teachers (Ingersoll, 2003).¹ In Texas, the number of teachers certified each year has been increasing over the past several years (Herbert, 2004)², but attrition rates have continued to create shortages in some districts and in some subjects.

Influences on Teacher Attrition

Although decisions about whether to enter and remain in teaching are ultimately personal ones that differ according to individuals’ needs and circumstances, researchers have examined several factors thought to be related to attrition. These can be broadly categorized as salaries and incentives, working conditions, induction and professional development, and assignments.

Salaries and Incentives: Salary increases and other financial incentives are often thought to be a primary motivator for teachers to remain in the classroom. Indeed, a number of states and districts have begun to offer signing bonuses, student loan forgiveness programs, and other financial incentives to prevent teachers from quitting. While popular, financial incentives have not been found to be strongly associated with teacher retention. Hanushek, Rivkin and Kain (2002)³ found that teacher mobility (transferring and leaving) was more strongly associated with the achievement and race of students in teachers’ schools than with salaries. Using data from Texas teachers and schools, they estimated that salaries would need to be increased by 10-50% to offset the likelihood of teachers quitting in different types of schools. They surmised that student achievement and race may act as proxies for difficult working conditions in schools with low academic performance and high African American and Hispanic populations. Lankford, Loeb and Wyckoff (2002)⁴ also found that teacher attrition was higher in urban schools with high percentages of minority and economically disadvantaged students, and that these schools likely present more difficulties for teachers. A qualitative study of Massachusetts’s Signing Bonus

¹ Ingersoll, R.M. (September 2003). *Is there really a teacher shortage?* Center for the Study of Teaching and Policy: University of Washington.

² Herbert, K.S. (April 2004). *Production and retention of beginning teachers from 1999 to 2003: A comparison of preparation routes.* State Board for Educator Certification: Austin, TX.

³ Hanushek, E.A., Kain, J.F. & Rivkin, S.G. (forthcoming). Why public schools lose teachers. *Journal of Human Resources.*

⁴ Lankford, H., Loeb, S. & Wyckoff, J. (2002). Teacher sorting and the plight of urban schools: A descriptive analysis. *Educational Evaluation and Policy Analysis, 24*(1), 37-62.

program, which offers selected individuals \$20,000 over four years if they complete an accelerated certification program and enter teaching, found that the accelerated certification process was more of an enticement to teachers than the bonus.⁵

Working Conditions: Recently, researchers have examined the relationship between the conditions and circumstances surrounding teachers' work and attrition. Using the Schools and Staffing Survey, a national survey of thousands of teachers and administrators, Ingersoll (2003) found that about half of teachers reported leaving teaching (not just moving to another district) to pursue other careers or because they were dissatisfied with teaching (25% left to retire). Of those who were dissatisfied with teaching, 61% cited poor salaries, 32% poor administrative support, and 24% student discipline problems. Further, he found that teachers in schools with higher salaries, more administrative support, and fewer student discipline problems were less likely to leave teaching or move to other districts. While salaries appear to dominate his findings, inadequate pay may also be exacerbated by conditions, such as lack of support and discipline problems, which make it difficult for teachers to achieve success in the classroom (Johnson and Birkeland, 2002).⁶

As research in this area is relatively new, few specific policy strategies have been developed. However, a large body of research exists in school reform that may be relevant here. Research on schools that have effectively implemented reforms and produced high academic achievement has found that building the overall capacity of schools is important. Schools with high capacity tend to have strong, supportive leaders, and cohesive professional communities that are focused on student learning and instructional improvement. This type of capacity is related to authority to develop and implement goals at the campus level, leadership that focuses on supporting teachers in implementing those goals and obtaining needed resources for school goals, professional development within the school that involves the faculty as a group, and strong internal accountability systems.⁷

Induction and Professional Development: Given the importance of working conditions that has emerged in research on teacher attrition, programs designed to enhance teachers' skills in the classroom have been of recent interest to policymakers as a possible strategy for retaining teachers and improving their quality. Induction programs that provide mentoring, training, and support to beginning teachers (those with 0-5 years of experience) have proliferated as a result. In a recent review of research on teacher mentoring programs, Ingersoll and Kralik (2004)⁸ found that mentoring programs for new teachers have positive effects on teacher retention. One

⁵ It is important to note that these findings were from a qualitative study with a very small sample, and should not be used to generalize to all teachers.

⁶ Johnson, S.M. & Birkeland, S.E. (October 2002). *Pursuing a "sense of success": New teachers explain their career decisions*. Harvard Graduate School of Education.

⁷ See, for example: Bryk, A.S., Lee, V.E. & Holland, P.B. (1993). *Catholic schools and the common good*. Harvard University Press: Cambridge, MA.; Hatch, T. & Herbert, K.S. (2002). *Keeping up the good work: Developing and sustaining capacity for school improvement*. Paper presented at the Annual Meeting of the American Educational Research Association, Seattle, WA, April 10-14, 2001.; Newmann, F.M. et al. (1997). Accountability and school performance: Implications from restructuring schools. *Harvard Educational Review*, 67(1), 41-74.

⁸ Ingersoll, R. & Kralik, J.M. (February 2004). *The impact of mentoring on teacher retention: What the research says*. Education Commission of the States: Denver, CO.

of the programs reviewed was the Texas Beginning Educator Support System (TxBESS). TxBESS is a comprehensive mentoring program for beginning teachers available to districts across the state. Evaluations of TxBESS have found that teachers in the program leave teaching at lower rates than do beginning teachers who do not participate.⁹ Of teachers who began teaching in 1999-2000, 85% of TxBESS teachers were still teaching in 2001-2002, while only 75% of teachers who did not participate returned for their second year. Furthermore, TxBESS teachers had higher retention rates in schools with large populations of minority and economically disadvantaged students, which also had higher numbers of beginning teachers participating in the program.

Assignments: Often, teachers are assigned to teach students or subjects for which they have not been trained to teach. Novice teachers, as new teachers in their schools, are often assigned to low-performing classrooms since those are the most difficult and undesirable assignments. Teachers from alternative certification programs are also more likely to teach in low-performing urban schools, which may partly explain their higher attrition rates.¹⁰ Teachers are also frequently assigned to teach out of field, a practice that occurs across subjects and grade levels.¹¹ There have been no large scale empirical studies to examine the relationship between such assignments and attrition, but they are thought to be related to the high attrition rates in school with high minority and economically disadvantaged student populations, which also tend to have high rates of out of field teaching and special student populations.¹²

Definitions of Teacher Shortage

For a number of years, educators and policy makers have tried to address the problem of teacher shortages. One of the difficulties with this issue is that a shortage can be defined in a number of ways. Shortages can be defined as low supply of teachers, high teacher turnover, or a lack of qualified teachers. Shortages can also be identified at the national, state, regional, district, or campus level.

Supply definitions of shortage have traditionally received the most attention. In the 1980s, a number of researchers warned of a widespread dearth of teachers looming ahead in the next decade. The warnings stemmed from the expected convergence of three trends: increasing student enrollments, decreasing numbers of college graduates entering teaching, and increasing teacher retirements. However, it was difficult to empirically examine these claims because of a lack of data on teacher demand and supply (Ingersoll, 1997)¹³.

⁹ Charles A. Dana Center. (2002). *Texas Beginning Educator Support System evaluation report for year three – 2001-02*. Author: Austin, TX.

¹⁰ Shen, J. (1998). Has the alternative certification policy materialized its promise? A comparison between traditionally and alternatively certified teachers in public schools. *Educational Evaluation and Policy Analysis*, 19(3), 276-83.

¹¹ See *Who Is Teaching* reports from the State Board for Educator Certification. Available at http://www.sbec.state.tx.us/Reports/WhoisTeaching/frm_whois_main.asp.

¹² Ingersoll, R.M. (1999). The problem of underqualified teachers in American secondary schools. *Educational Researcher*, 28(2), 26-37.

¹³ Ingersoll, R. (1997). Teacher turnover and teacher quality: The recurring myth of teacher shortages. *Teachers College Record*, 91(1), 41-44.

When better data did become available nationally and statewide, demand for teachers was indeed found to be high, student enrollments had increased, and teacher retirements were also on the rise. However, very few teaching positions have ever been found to be left unfilled. Districts simply cannot and do not leave classes of students without teachers. Instead, they use various strategies to assign those students to teachers. District administrators and school principals typically prefer to hire qualified teachers. When qualified teachers are not available, they typically hire less qualified teachers, assign teachers to teach subjects other than those in which they have been trained, or assign substitute teachers. In each case, teachers are assigned “out of field,” or outside the subjects in which they have sufficient knowledge to teach.

Out of field teaching may be an effective coping strategy for districts with inadequate personnel, but it can lower the quality of instruction provided to students. Teachers who do not understand the content they are teaching, or do not know how to effectively instruct students in that content cannot be expected to improve student learning to the same extent as teachers who are knowledgeable in content and instructional methods. Students who are continuously taught by underqualified teachers will have difficulty meeting standards and expectations for learning.

While it could be assumed that assigning teachers out of field is a symptom of a larger teacher shortage (i.e. teachers are assigned out of field because there are too few qualified teachers), this is not the case. There are, in fact, more qualified teachers than are needed to fill teaching positions that are occupied by out of field teachers. As of 2002, there were approximately 420,000 individuals holding valid teaching certificates in Texas, but only about 290,000 teachers employed in Texas public schools.

Shortages of qualified teachers that force out of field assignments are caused not by an insufficient supply, but by demand resulting from inadequate staffing due to out of field teaching, and from high rates of turnover and attrition among teachers. When teachers leave the profession, transfer to other districts or campuses, or move into administrative positions, their classroom assignments must be filled by other teachers. Many of those assignments are left to be filled by teachers assigned out of field. Moreover, high turnover and attrition rates cause continuous shortages even if production of new teachers is increased because those new teachers subsequently leave the classroom, and more new teachers must be produced to take their places. An analogy can be drawn to a sink with an open drain: the sink will never be completely full until the drain is plugged.

Financial Incentives for Teachers

To address shortages of qualified teachers and teacher attrition, states and districts have begun to turn to financial incentives to retain qualified teachers and recruit new ones to particular districts and subjects. Financial incentives for teachers typically take one of two forms, performance pay plans or incentive plans. Performance pay plans create salary schedules and/or bonus programs for teachers or schools that meet specified performance standards. Incentive plans usually provide bonuses and/or incentives to teachers who choose to teach in hard-to-staff schools.

While similar in intent – using financial incentives to motivate teachers – these two types of plans are not the same. Performance pay is directed to all teachers, and is based on some measure of teaching performance, usually either evaluations, student achievement, or a combination of the two. Incentive plans are usually directed to teachers who are new to a district (they may be new or veteran teachers). Incentives are provided only to teachers who teach in certain districts or schools (e.g. those with high poverty, or in rural areas), or who teach certain subjects (e.g. science or special education). Districts or campuses to which incentives are directed are usually those in which shortages of teachers have been identified. Performance pay plans are not designed to alleviate shortages, but to improve teacher performance in all districts and subjects.¹⁴

Each type of plan comes with its own set of challenges. The primary challenge in performance pay plans is identifying teachers who have met performance standards, and creating plans that can apply to all teachers. Incentive plans are typically designed to alleviate teacher shortages, and their main challenge comes in identifying shortages. An incentive plan recently approved in Arkansas provides signing bonuses and retention incentives to teachers in small, high-poverty districts. Louisiana’s incentive plan, approved in 2003, provides signing bonuses and retention incentives to highly qualified teachers in schools that are underperforming or located in geographically disadvantaged areas, and who teach subjects identified as critical to the improvement of student performance. Each of these plans attempts to identify shortages, but these criteria can result in schools and subjects being identified as high-need one year and not the next.

This could be particularly problematic when shortages are identified by subjects. Needs for teachers by subject are highly dependent on student enrollments and teacher supplies, and are sensitive to small shifts in either. An increase in student enrollment that necessitates the addition of one class can create a need for a new teacher if all other teachers are already fully assigned. That extra class may not be needed the following year. In addition, a “bulge” in student enrollment in one or two grades may create a need for more teachers at those grade levels for one or two years, but they may not be needed in subsequent years. Incentive plans designed around shortages in subjects may not be able to respond quickly enough to these types of needs, and they may also over-respond, providing several years of incentives to teachers who may only be truly needed for one or two years. Additionally, plans that use demographics or performance ratings to identify needs for teachers may not be subject to so much variation in demand from year to year, but they can still be imprecise in directing incentives where they are most needed since those variables may change over time.

Teacher Turnover and Out of Field Teaching in Texas Districts

It may be more effective to direct incentives toward more direct measures of teacher shortages and attrition. Texas has a wealth of information on teachers’ employment patterns and qualifications that can be used to identify districts with critical needs for qualified teachers, and with especially high rates of teacher turnover. This report provides data on average teacher turnover rates and average rates of out of field teaching for each district from 2000-2001 to

¹⁴ Education Commission of the States. (2001). *Issue paper: Pay for performance. Pay-for-performance: Key questions and lessons from five current models*. Author: Denver, CO.

2003-2004. Actual district turnover and out of field rates are attached. Details of the analysis, including definitions and calculations, are contained in the Technical Appendix.

Average Teacher Turnover

For this analysis, turnover was defined as the percentage of teachers employed in a district in one year, but not the next. Teachers who moved from one district to another were included in percentages of teachers leaving a particular district, even though they did not leave the profession. Available data did not allow us to determine teachers' reasons for leaving, whether retirement, career change, or termination. Therefore, the data provide a general overview of rates at which teachers left districts. Turnover rates presented here are average rates from 2000-2001 to 2003-2004.

The highest average district teacher turnover rate found was 55.51%. Only three districts had no turnover between 2000-2001 and 2003-2004. Turnover tended to be lower in larger districts and higher in smaller districts, although the relationship between district size and average turnover was small (correlation = $-.148$, $p=.000$).

We also examined average turnover rates in relation to districts' community types as defined by the Texas Education Agency. Districts are categorized according to size, area population, and growth rates into community type classifications of major urban, major suburban, central city, central city suburban, independent town, non-metro: fast-growing, non-metro: stable, and rural. Definitions for these categories are included in Appendix B. The relationship between community type and average turnover rates was small (adjusted $R^2=.048$, $F=7.525$, $p=.000$). Community type explained only 4.8% of the variance in average turnover rates between districts. Major urban districts had lower turnover rates relative to other community types. This may be related to district size, since major urban districts are quite large. The districts with the highest turnover rates were very small rural districts with only one or two campuses. However, the districts with no turnover were also very small rural districts.

In examining average turnover rates for campuses that act as their own LEAs, such as charter schools and alternative schools, we found a much wider range of turnover rates. This could indicate that these particular types of campuses are prone to higher teacher attrition. However, it could also indicate that there is more variation in teacher turnover at the campus level than at the district level. The finding that the highest average turnover rates occurred in rural districts with only one or two campuses supports this. A district with relatively low turnover could have some campuses with very little or no turnover and other campuses with very high turnover. Analyzing turnover by districts rather than by campuses obscures some of this variation. This may have been one reason for the relatively low overall turnover rates we found in this analysis.

Average Rates of Out of Field Teaching

Rates of out of field teaching were higher than those found for teacher turnover. The highest average rate of out of field teaching was 65.88%. Only two districts had no teachers assigned out of field between 2001 and 2004. As with turnover, out of field teaching tended to

be higher in smaller districts and lower in larger districts. The relationship between out of field teaching and district size was greater than that for turnover, but was still relatively modest (correlation = $-.264$, $p=.000$). Out of field teaching was also examined by district community type. The relationship between community type and average out of field teaching rates was stronger than that for turnover, but was still rather small (adjusted $R^2=.132$, $F=23.359$, $p=.000$). Community type explained only 13% of the variance in average out of field rates between districts. Rates were often higher in rural districts, which may also be related to district size.

As with turnover, the districts with the highest rates of out of field teaching were very small, with only one or two campuses. At the same time, the two districts with no out of field teaching were also very small rural districts. Although we did not examine out of field teaching for campus-based LEAs, the stronger relationship between out of field teaching and district size indicated that there may also be greater variation among campuses than among districts.

Conclusions

There appear to be some small differences among different types of districts in teacher turnover and out of field teaching. Districts that are small, and possibly located in more remote areas, may have higher turnover and greater rates of out of field teaching. In previous analyses, we found very small associations between average district teacher salaries or district student composition and teacher attrition. These results are shown in Appendix A.

The limited relationships we have found between turnover and out of field teaching indicate that it may be more useful to examine and address these issues at the campus level rather than at the district level. Employment and assignment decisions are largely campus-level issues. Teachers are more likely to base decisions about whether to leave a district on their experiences on their campuses, or on their personal choices rather than on district-wide considerations. Additionally, a district-level analysis of teacher turnover does not account for the disruption caused in schools by transfers within districts. In large districts with low rates of turnover, there may be considerable turnover among campuses as teachers transfer within the district. In very small districts with only one or two campuses, teachers do not have as many (if any) transfer options, so they would be more likely to leave the district altogether.

Similarly, decisions to assign teachers out of field are more likely to be based on campus needs that are driven by their individual budgets and student enrollments. It is very likely that within districts with relatively low rates of out of field teaching, some campuses have many teachers assigned out of field and others have very few if any teachers out of field due to differences in enrollments, staff, and administrative decisions.

We analyzed campus data for 2003 only to determine whether rates of turnover and out of field teaching might differ from those obtained for districts. As expected, the range of turnover and out of field teaching rates was much greater. Both turnover and out of field teaching percentages ranged from 0% to 100%. More importantly, large districts with low turnover and out of field teaching rates had a number of campuses with high rates. Dallas ISD, for example, had an average turnover rate of 16%, but turnover from 2003-2004 on campuses in

the district ranged from 0% to 96%. Much of the campus turnover in this district may be due to transfers within the district, with relatively few teachers leaving the district altogether. Similarly, Dallas ISD's average rate of out of field teaching was 36.82%, but campus rates ranged from 0% to 75.38%. The campus rates we examined were only for one year, 2003, so direct comparisons cannot be made to district rates obtained, which were averages over four years. However, they do indicate that turnover and out of field teaching rates can differ dramatically when examined by campus rather than district. Turnover and out of field teaching rates for all campuses are attached.

The effects of high rates of teacher turnover and out of field teaching are felt most acutely on campuses, as principals struggle to hire qualified teachers and fill classroom assignments at the same time. Students and staff on those campuses also most directly feel the effects of disruptions caused by teachers leaving and attempting to teach courses for which they have not been trained. Incentives to address teacher turnover and out of field teaching may best be directed toward individual campuses rather than to districts. Funds directed to districts may not reach campuses that truly have needs in these areas, and may also be directed to campuses that do not need them. A campus-based incentive plan, on the other hand, would most precisely direct funds toward the source of both the problem and the solution: the work environments of teachers.

Districts do, of course, have an important role to play in recruiting and retaining teachers. We have previously found that teachers are most likely to leave teaching within their first five years. Indeed, we found that 64% of teachers who quit within a five year period did so within their first three years of teaching. Districts can help to alleviate this attrition by providing induction and mentoring to beginning teachers. Many beginning teachers leave because they are overwhelmed by the challenges of teaching in their first few years. These teachers often receive little support to improve their skills in the classroom, become frustrated, and give up. Induction and mentoring programs can provide needed support and assistance to beginning teachers to help them develop the skills they need to achieve some success in the classroom, which may encourage them to continue teaching.¹⁵ In addition, mentoring programs may provide benefits to mentor teachers and others who train beginners.

The cost of mentoring and induction programs varies according to the program used. SBEC staff has estimated that the cost for TxBESS, for example, is about \$3,000 to \$7,000 per year per beginning teacher, which includes costs for stipends for mentor teachers, release time and substitute teachers for mentor and mentee teachers, training for mentors, and materials. Costs vary depending on the amount of stipends offered to mentor teachers. There is no charge to districts for materials, and districts have discretion over the stipends paid to mentors and release time provided to teachers involved.

An incentive plan based on campus needs for recruiting and retaining qualified teachers, combined with district-level funding for structured mentoring programs could be quite effective in reducing teacher turnover and increasing the number of qualified teachers in classrooms. Any policy intervention, of course, will need to be carefully planned and implemented to target the areas of greatest need to best serve the teachers and students of Texas.

¹⁵ Ingersoll & Kralik (2004).

Technical Appendix

Data Sources

Data were obtained from SBEC certification records, employment records from the Public Education Information Management System (PEIMS), and the Academic Excellence Indicator System (AEIS). Employment records for teachers employed in Texas public school districts between 2000 and 2004 were used. Certification records for all teachers employed in Texas public school districts were used.

Only classroom teachers of record were included in analysis. Substitute teachers were excluded. Only school districts were included in analysis. Charter schools and other campus-based LEAs, as well as alternative instructional campuses were excluded because requirements for those campuses for teacher qualifications and assignments differ somewhat from those of regular instructional campuses. Student membership figures were used for student enrollment.

Methods

Turnover rates were computed as the number of teachers who were employed in a district in year 1, but not employed in that district in year 2 divided by the number of teachers employed in the district in year 1, multiplied by 100. Those rates were computed for 2000, 2001, 2002, and 2003. Averages weighted by the number of teachers employed each year were computed to obtain average yearly turnover rates.

Turnover rates should not be interpreted as similar to attrition rates. Attrition analyses examine rates at which teachers leave teaching, meaning leaving a district and not becoming employed in another district. Turnover examines rates at which teachers leave a district from one year to another, and includes teachers who move to other districts. Transfers from one campus to another within a district are not included in the turnover rates presented here because turnover was examined at the district, not campus, level.

Out of field teaching rates were computed as the percentage of teachers in a given year who did not hold a standard teaching certificate in the subject to which they were assigned. Teachers must have held standard teaching certificates in the specific subjects taught, not the subject area, to be considered teaching in-field. An in-field biology teacher must have held a standard teaching certificate in biology at the grade level taught. Other science certificates or grade levels would be considered teaching out of field. Other types of certificates, such as probationary certificates, were also considered out of field.

Appendix A

Previous Studies on Teacher Attrition

The following table shows results for a study of teacher attrition by years of experience. We examined attrition for one group of teachers, those who received an initial standard teaching certificate in 1998, over a period of five years, from 1999 to 2004. This group was rather large, with 18,070 teachers, and was representative of the total population of teachers in Texas even though they were all initially certified in 1998. In other words, the years of experience for this sample did not differ greatly from the distribution found in the total population of teachers. It is not uncommon for teachers to teach on permits or other certificates (such as probationary certificates) before becoming fully certified. In addition, about 20% of teachers who receive initial certification each year have out-of-state teaching credentials, and may have taught for many years in other states before relocating to Texas.

Of these 18,070 educators, 5,403 (29.9%) had left teaching in Texas public schools by 2004. The following table shows the years of experience of those teachers who quit teaching. About 90% of teachers in the sample who quit had done so by their fifth year of teaching.

Table 1: Years of Experience of Teachers Who Quit Teaching from 1999-2004

Years of Experience*	Percentage of Teachers Who Quit	Cumulative Percentage	Count of Teachers
1	12%	12%	638
2	16%	28%	881
3	18%	46%	989
4	17%	64%	940
5	17%	80%	891
6	10%	90%	519
7	3%	93%	184
8	2%	95%	97
9	0.9%	96%	49
10	0.6%	96.5%	32
11	0.5%	96.9%	27
12	0.4%	97.4%	22
13	0.2%	97.6%	11
14	0.3%	97.9%	16
15	0.3%	98.2%	16
16	0.2%	98.4%	11
17	0.2%	98.6%	11
18	0.1%	98.7%	5
19	0.1%	98.8%	5
20	0.1%	98.9%	5
21	0.1%	99.1%	5
22	0.1%	99.2%	5
23	0.1%	99.3%	5
24	0.1%	99.4%	5
25	0.1%	99.5%	5
26	0.1%	99.6%	5
27	0%	100%	0
28	0.1%	99.7%	5
29	0.1%	99.7%	5
30	0%	100%	0
31	0.1%	99.9%	5
32	0.1%	99.9%	5
33	0%	100%	0
38	0%	100%	0
39	0%	100%	0
Total	100%	100%	5,403

* Years of experience indicates how many years a teacher taught before quitting. Quitting was identified as not being employed in a Texas public school district for at least two consecutive years during the period from 1999 to 2004.

Attrition by District Student Composition and District Base Teacher Salary

The following tables show results from a study of teacher attrition by district student composition and district teacher average base salary. The same sample of teachers used for the study of attrition by years of experience was used, with some teachers excluded for this particular analysis. In order to identify district characteristics, information on the districts in which teachers were teaching in 1999 was used, which excluded teachers who did not teach in 1999. Additionally, teachers who taught through 2004 were excluded since we wanted to identify teachers who had left teaching for two or more years. A final sample of 9,776 teachers was used for the study.

Table 2: Descriptive Statistics for Teacher Attrition Rates by District Characteristics

District Characteristic	Teachers Who Stayed			Teachers Who Quit		
	Mean	SD	SE	Mean	SD	SE
% White Students	42.5%	28.393	0.345	45.6%	27.126	0.496
% Hispanic Students	40.5%	29.479	0.358	35.7%	25.969	0.475
% African American Students	13.8%	13.981	0.17	15.0%	13.606	0.249
% Asian/Pacific Islander Students	2.8%	3.592	0.044	3.3%	3.754	0.069
Teacher Base Salary	\$ 28,003.31	2,207.06	26.80	\$28,172.35	2,244.13	41.02

Note. For teachers who stayed, $N = 6,783$. For teachers who quit, $N = 2,993$. *SD* = standard deviation, *SE* = standard error of the mean.

Table 3: Independent Samples *t* Test Results for the Association between District Characteristics and Teacher Attrition

District Characteristic	<i>t</i>	<i>df</i>	<i>p</i>	Mean Difference	CI_{95}^a
Percentage of Students					
White	-5.083 ^b	5968.79	.000	-3.07	-4.253 – -1.886
Hispanic	8.093 ^b	6442.84	.000	4.81	3.646 – 5.977
African American	-4.054 ^c	9774	.000	-1.23	-1.830 – -0.637
Asian/Pacific Islander	-6.102 ^b	5501.12	.000	-0.50	-0.656 – -0.337
Base Salary Average ^d	-3.472 ^c	9772	.001	\$ -169.04	-264.469 – -73.606

^aThe 95% confidence interval around the mean. ^bApproximate *t* value. ^cExact Student's *t* value.

^dTeacher's 1-5 Year Average Base Salary.

Table 2 shows that there were some differences in the sample between the districts of the group of teachers who stayed, and that of teachers who quit within five years. The average percentages of white students and African American students were slightly higher for teachers who quit (i.e. the average percentage in districts from which teachers quit teaching). The average percentage of Hispanic students, however, was lower in districts from which teachers quit. Table 3 shows results of statistical analysis, which indicate weak relationships between the district characteristics examined and teacher attrition. Mean differences were small, and confidence intervals for mean differences overlap for most variables, indicating that actual mean differences are similar in the population.

Appendix B

Definitions of District Community Type

Source: Texas Education Agency

Districts are classified on a scale ranging from major urban to rural. The charter school districts are in a separate subcategory. Factors such as size, growth rates, student economic status, and proximity to urban areas are used to determine the appropriate group. The groups are:

Major Urban:

The largest school districts in the state that serve the six metropolitan areas of Houston, Dallas, San Antonio, Fort Worth, Austin, and El Paso. A district is designated major urban if it is the largest in counties with populations of 650,000 or over, and there are at least 35% low-income students in the school district. Or, if not the largest district in the county, the number of students in membership is 75% of the largest district and there are at least 35% low-income students in the district.

Major Suburban:

Other school districts in and around the major urban areas. A district is major suburban if it is contiguous to a major urban district and the number of students in membership is at least 3% of the major urban district, or an enrollment of at least 4,500. If a district is not contiguous to a major urban area, then it must be within the same county and have an enrollment of 15% of the major urban district or an enrollment of at least 4,500 in order to be classified as major suburban.

Central City:

The major school districts in other large Texas cities. If the district is not contiguous to one of the major urban districts but the county population is between 100,000 and 650,000 and it is the largest district in the county or its population is 75% of the largest district then the district is designated as other central city.

Central City Suburban:

Other school districts in and around the other large, but not major, Texas cities. If the district is in a county between 100,000 and 650,000 population and the number of students in membership is at least 15% of the largest district in the county then it is designated central city suburban. If a district is contiguous to a central city district, its population is greater than 3% of that district's, and the number of students in membership is greater than the corresponding median figure for the state, it is also central city suburban.

Independent Town:

If the district is the largest in a county having a population of 25,000 to 100,000, or the number of students in membership is greater than 75% of the largest district, the district is considered an independent town.

Non-Metro: Fast Growing:

The school districts that fail to be in any of the above subcategories and that exhibit a five-year growth rate of at least 20 percent. These districts must have at least 300 students in membership.

Non-Metro: Stable:

The school districts that fail to be in any of the above subcategories, yet the number of students in membership exceeds the state median of 704.5.

Rural:

The school districts that fail all of the above tests for placement into a subcategory. These districts either have a growth rate less than 20 percent and the number of students in membership is between 300 and the state median of 704.5, or the number of students in membership is less than 300.

Charter Schools:

The 185 open-enrollment schools granted a charter by the State Board of Education for operation during 2002-2003. Open-enrollment charter schools operate in a facility of a commercial or nonprofit entity or a school district.