

Section 2

The Existing Texas Cost-of-Education Index

2.1 INTRODUCTION

This section provides an explanation of the current Cost-of-Education Index, or CEI, including an analysis of the effects of updating the existing CEI using more current data. The Cost-of-Education Index is the mechanism that Texas uses to adjust foundation program calculations to compensate for variations in resource costs and costs of education beyond the control of school districts. Under current law, the CEI affects the distribution of approximately \$1.23 billion in state aid to school districts during each year of the 1999–2000 biennium. The existing CEI has not been updated since its adoption in 1990, however, which means that approximately thirteen percent of state aid to school districts is currently distributed on the basis of a ten-year-old analysis of school district expenditures.

2.2 ELEMENTS OF THE EXISTING CEI

The existing Cost-of-Education Index is composed of two parts: (1) a **price component**, which attempts to compensate for regional variations in resource costs and the costs of education, and (2) a **scale component**, which addresses higher costs associated with providing educational services in districts with student populations between 1,600 and 2,000.

2.2.1 The Price Component of the CEI (TAC/203.10)

The price component of the Cost-of-Education Index is designed to adjust for variations in teacher payroll costs that are beyond the control of school districts. Legislative Education Board researchers used multiple regression analysis¹ to assess the impact of certain controllable and uncontrollable factors on the predicted salary of a teacher. In the case of the 1990 CEI, the dependent variable was teacher salaries. The explanatory factors that were included in this analysis are presented in Figure 2.2.1.a.

Figure 2.2.1.a: Controllable and uncontrollable factors included in calculation of the price component of the CEI

Controllable factors (or factors adjusted for elsewhere in the Foundation School Program)	Uncontrollable factors
<p><u>District level:</u></p> <ul style="list-style-type: none"> • Property wealth per teacher • Total effective tax rate • Graduation rate • Percent minority teaching staff • Non-salary benefit expenditures per pupil <p><u>Teacher level:</u></p> <ul style="list-style-type: none"> • Whether the teacher has an advanced degree • Whether the teacher is assigned to grades 7–12 • Total years of teaching experience 	<p><u>District level:</u></p> <ul style="list-style-type: none"> • Competitive beginning average teacher salary • Location in a county with fewer than 40,000 people • Percent low-income pupils • District type • District size in terms of students in Average Daily Attendance (ADA)

The 1990 regression model that was used to isolate uncontrollable price variations identified five factors that were found to have an impact on teacher salaries: competitive beginning average teacher salary in contiguous counties, location in a rural county (less than 40,000 population), percentage low-income students, district type (independent town or rural), and district size in terms of average daily attendance. To determine an index, the Legislative Education Board researchers calculated the independent impact of each of these uncontrollable factors on the predicted salary of a teacher when all other factors were held constant. For example, they analyzed how variations in the percentage of low-income students in a school district caused predicted teacher salaries to change when all other factors remained constant. Figure 2.2.1.b was constructed for developing the price component, based on the results of the regression analysis.

Figure 2.2.1.b: The price component of the CEI (TAC / 203.10)

Amount to add to 1.00	Competitive beginning average teacher salary	County population less than 40,000?	District type	Percent low income students	ADA
-0.01			Independent Town		
.00	Below \$17,300	No		Below 50%	200 to 499
.01	\$17,300 to \$17,750	Yes	Rural	50 - < 68%	500 to 999 or < 200
.02	\$17,751 to \$18,250			68 - < 77%	1000 to 1,599
.03	\$18,251 to \$18,700			77 - < 86%	1,600 to 2,399
.04	\$18,701 to \$19,100			86 - < 93%	2,400 to 3,599
.05	\$19,101 to \$19,500			93% or more	3,600 to 5,399
.06	\$19,501 to \$20,000				5,400 to 8,499
.07	\$20,001 to \$20,450				8,500 or more
.08	\$20,451 to \$20,850				
.09	\$20,851 or more				

Competitive beginning average teacher salary for a district is the average annual salary of beginning instructional personnel for all other districts in the same county as the district and all districts in counties contiguous to the district's county.

A district classified as an **Independent Town** is the largest school district in a county with a population of 25,000 to 100,000, or any other district in that county with an ADA of at least 75 percent of the largest district's ADA. Furthermore, the district must not be able to be classified by the Texas Education Agency as a major suburban district or another central city suburban district. Districts classified as **Rural** either have between 300 and 743 students in ADA and a growth rate of less than 20 percent or have less than 300 students in ADA.

Figure 2.2.1.c illustrates how the price component of the 1990 CEI was calculated for Abilene ISD, Austin ISD, Brownsville ISD, and Hale Center ISD. Note how a high competitive beginning average teacher salary, a larger percentage of low-income students, and a large district size in terms of average daily attendance results in a relatively higher CEI value for Brownsville.

Figure 2.2.1.c: Sample price component calculations

District	1989-1990 Competitive beginning average teacher salary	County population less than 40,000?	Independent Town or Rural?	Percent low income students	ADA	CEI value
Abilene ISD	\$18,052	No	No	41.54	17,466	1.09
Austin ISD	\$18,696	No	No	40.01	61,745	1.10
Brownsville ISD	\$21,222	No	No	80.76	38,866	1.19
Hale Center ISD	\$18,470	Yes	Rural	64.43	651	1.07

2.2.2 The Scale Component of the CEI (TAC/203.20)

The scale component of the CEI was designed to adjust for differences in economies of scale due to differences in district size, based on the number of students in average daily attendance. The scale component was originally designed to replace the small district adjustment. The legislature opted to retain the small district adjustment for districts with fewer than 1,600 students in average daily attendance, however, and limited the scale component of the CEI to districts with 1,600 to 2,000 students in average daily attendance. For these districts, the price component calculated using Figure 2.2.1.c is modified using the following equation:

$$\text{CEI} = \text{Price Component} \times (1.0 + ((2000 - \text{ADA}) \times .00014))$$

For example, a school district with 1,725 students in average daily attendance and a Price Component CEI of 1.08 would receive an adjusted CEI value of 1.12, because:

$$1.08 \times (1.0 + ((2000 - 1725) \times .00014)) = 1.12158$$

The difference between a CEI adjusted by the scale component and a CEI consisting only of the price component can be significant. For this sample district, the scale adjustment currently represents an additional \$72 per student in average daily attendance (the difference between an Adjusted Basic Allotment of \$2,681 and an Adjusted Basic Allotment of \$2,753). Depending upon the characteristics of the students, this difference will result in an increase in Tier 1 program costs to the district of at least \$124,200. Section 2.3 presents a more detailed discussion of how the existing CEI is applied to the Foundation School Program.

2.3 THE CEI AND THE FOUNDATION SCHOOL PROGRAM

The Cost-of-Education Index interacts with both Tier 1 and Tier 2 of the Foundation School Program, affecting the calculation of state and local money to which each district is entitled. In Tier 1, a district's final CEI, which combines the price component and the scale component outlined above, is applied to seventy-one percent of the district's Basic Allotment. In Tier 2, fifty percent of the effects of a district's CEI are incorporated into calculation of its Weighted Students in Average Daily Attendance (WADA).

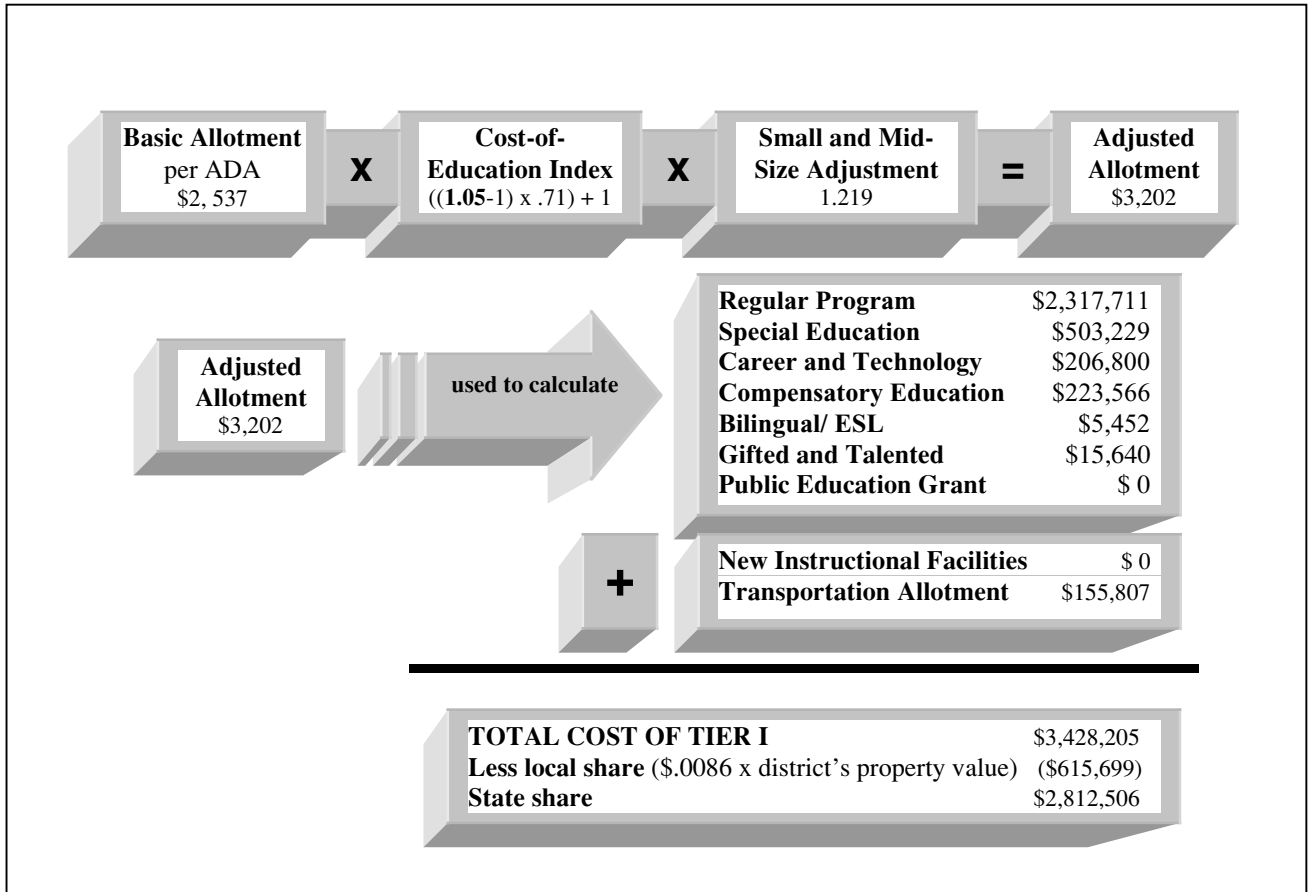
2.3.1 Tier 1

The Tier 1 program was originally designed to provide a basic foundation level of funding. About seventy-five percent of state aid distributed through the Foundation School Program is Tier 1 funds. To participate in Tier 1, all districts are required to levy a local property tax rate of \$0.86 per \$100 of property valuation.

Tier 1 includes funding for a basic education program, as well as funding for special education, career and technology, gifted and talented, compensatory education, bilingual/ESL, and Public Education Grant programs. Tier 1 also includes the new instructional facilities and transportation allotments. The Basic Allotment is the basic starting point for Tier 1 funding. The 1999—2000 Basic Allotment, set by statute in the Texas Education Code, is \$2,537 per student in average daily attendance.

Figure 2.3.1.a represents the basic 1999—2000 Tier 1 structure for a hypothetical district of 820 students in Refined Average Daily Attendance. This district has a CEI value of 1.05, an effective tax rate for Maintenance and Operations of \$1.32, and a certified property value of \$71,592,881.

Figure 2.3.1.a: Tier 1 program costs



The CEI and Tier 1

As Figure 2.3.1.a illustrates, the CEI is the first adjustment to the Basic Allotment. It increases funding per student to account for differences in resource costs that are beyond a school district's control. Each district's CEI is applied to seventy-one percent of the Basic Allotment to calculate the Adjusted Basic Allotment (ABA) using the following formula:

$$ABA = 2,537 \times (((CEI-1) \times .71) + 1)$$

Depending upon a district's CEI value, the resulting Adjusted Basic Allotment currently ranges from \$2,573 to \$2,897 per student in average daily attendance. For many districts, this number is further adjusted by the Small District and Mid-Sized District Adjustments, meaning that overall, the CEI affects all Tier 1 adjustments to the Basic Allotment. The CEI does not, however, affect the calculation of the New Instructional Facilities Allotment or the Transportation Allotment.

2.3.2 Tier 2

Tier 2 is the Guaranteed Yield Program. Tier 2 guarantees a revenue yield for each penny of tax effort² for Maintenance and Operations (M&O) above the 86 cents required for Tier 1.³ Districts may levy M&O taxes at any rate between \$.86 and \$1.50 per \$100 of property valuation. In return, the state guarantees that districts will generate no less than \$24.70 per penny of tax per Weighted Student in Average Daily Attendance (WADA), from a combination of state and local resources.

The CEI and Tier 2

The CEI interacts with the Guaranteed Yield Program in the way that WADA is calculated. The WADA figure for each district is based on the sum of the district's Tier 1 allotments (the Basic Allotment, CEI, and Small District or Mid-Sized District Adjustments, plus funding for special education, career and technology, gifted and talented, compensatory education, bilingual, and Public Education Grant programs) less the new instructional facilities allotment, transportation allotment, and fifty percent of the effects of the CEI.

Weighted Average Daily Attendance is used to calculate each district's Tier 2 funding (for eligible districts) and the equalized wealth level under Chapter 41 using the following formula:

$$GYA = (\$24.70 \times WADA \times DTR \times 100) - LR$$

WADA = number of weighted students in average daily attendance

DTR = the district's effective Maintenance and Operation (M&O) tax rate over \$.86 per \$100 of valuation, not to exceed \$.64

LR = the district's local revenue

A popular misunderstanding about the CEI is that it is simply a mechanism for increasing state aid to large urban school districts. Every Texas school district has a CEI value greater than 1.0, however, which means that every school district receives some adjustment to its foundation program calculations to compensate for uncontrollable variations in the costs of education.

Figure 2.3.2.a illustrates the effect of the existing CEI on the distribution of state aid to Texas school districts, by district size in terms of enrollment. In 1999—2000, the ten largest districts, which all have

enrollments of 50,000 or greater and which educated about twenty-two percent of the students in Texas in 1999—2000, received approximately nineteen percent of their state aid as a result of the CEI. Districts with between 3,000 and 4,999 students in average daily attendance received about nine percent of their state aid due to the CEI. It should be noted, however, that the fact that districts with larger enrollments receive more state aid as a result of the CEI is mostly a result of equalization mechanisms tied to property values. The two districts with the highest existing CEI values are La Joya ISD and Roma ISD, both of which have CEI values of 1.20.

Figure 2.3.2.a: Impact of the existing CEI on total distribution of state aid to Texas school districts by enrollment grouping 1999-2000

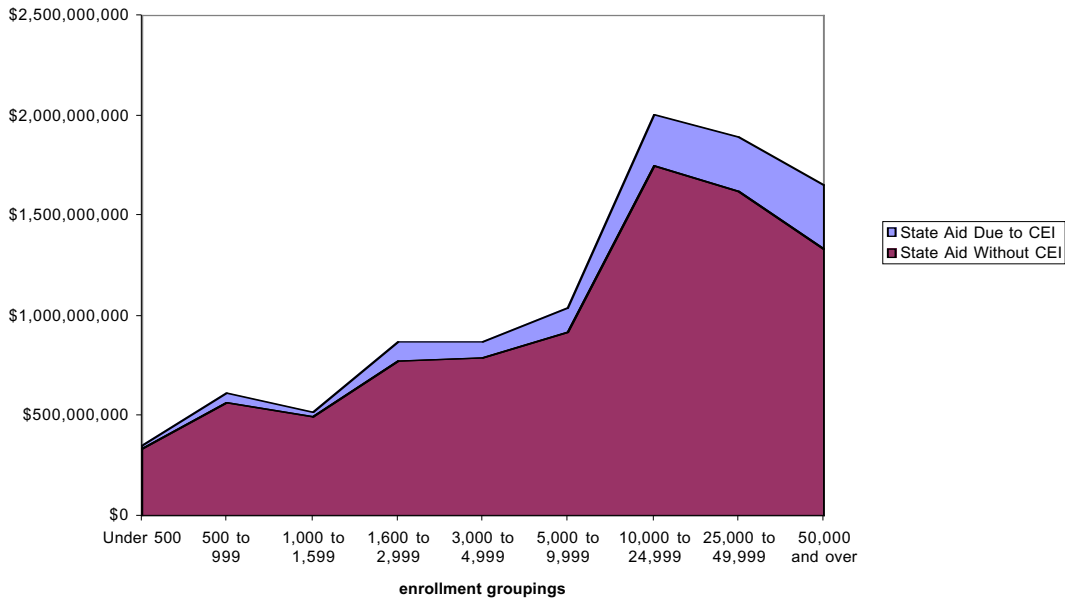
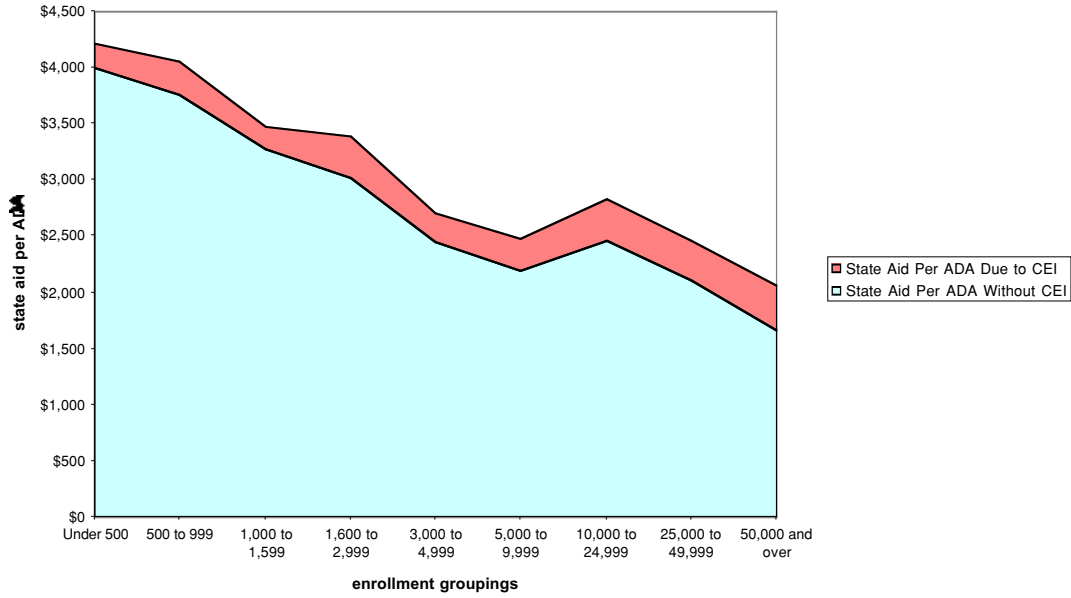


Figure 2.3.2.b illustrates another perspective on the effect of the existing CEI on the distribution of state aid to school districts, in terms of state aid per student in average daily attendance. School districts with 50,000 students or more receive, on average, \$397 out of \$1,666 in state aid per average daily attendance as a result of the CEI. School districts with 500 to 999 students receive \$295 out of \$3,761 in state aid per average daily attendance.

Figure 2.3.2.b: Impact of the existing CEI on distribution of state aid per ADA to Texas school districts by enrollment groupings 1999-2000



2.4 UPDATING THE EXISTING CEI

In the initial phase of our study, we explored the impact of updating the existing CEI with more current information using data from the 1998–99 school year. We used the same controllable and uncontrollable variables in a regression equation as were used to generate the existing price component of the CEI. In the process of updating the original model, we had to deviate slightly from the original process, however, in order to maintain correct statistical method and to follow the guidelines of the current education code. For example, we included all eight district type classifications (urban, suburban, central city, central city/suburban, independent town, non-metro/fast-growth, non-metro/stable, or rural), because our analysis showed that all of these district types had a significant impact on teacher salaries. We also included nurses and librarians in the computation of the competitive beginning average salary in the surrounding areas, because nurses and librarians have been added to the minimum salary schedule.

The data that were used for this analysis included information from TEA on 229,449 full-time teachers. Of those, seven teachers with more than 50 years of experience were deleted as unrepresentative of the teaching population, as were 295 charter school teachers.⁴ An additional 1,533 teachers from districts that either do not levy property taxes (such as Lackland ISD) or do not have a high school and therefore do not have a graduation rate (such as Lovejoy ISD) also had to be omitted from the analysis.⁵ These changes left 227,614 full-time teachers representing 950 traditional Texas school districts in the database for the replication.

The resulting model explains approximately ninety-one percent of the variation in teacher salaries. The resulting district indices range from 1.03 to 1.23. As a general rule, these index values are lowest in rural parts of the Panhandle, and highest in Houston and in counties that border Mexico.

It is important to note that the updated version of the existing CEI generates predicted teacher salaries below the state minimum salary scale for 303 Texas districts. For consistency with the existing CEI,

this pattern was ignored in the construction of the index. We used the results of this analysis to construct the price index shown in Figure 2.4.a.

Figure 2.4.a: Updated CEI price component (1998-1999 data)

Amount to add to 1.00	Competitive beginning average teacher salary	County population less than 40,000?	District type	Percent low income students	ADA
.00	\$21,286 to \$22,529	No	Independent Town	.14 to .60	71 to 290
.01	\$22,530 to \$23,349	Yes	Other Central City: Fast Growth Other Central City: Suburban	.61 to .76 < .14	291 to 515 or 45 to 70
.02	\$23,350 to \$24,150		Non-Metro Fast Growing Non-Metro: Stable Major Urban	.77 to .87	516 to 788 or 34 to 44
.03	\$24,160 to \$24,959		Major Suburban Rural	.88 to .96	789 to 1136 < 33
.04	\$24,960 to \$25,759			> .96	1,137 to 1,600
.05	\$25,760 to \$26,539				1,601 to 2,200
.06	\$26,540 to \$27,319				2,201 to 3,050
.07	\$27,320 to \$28,089				3,051 to 4,150
.08	\$28,090 to \$28,859				4,151 to 5,750
.09	\$28,860 to \$29,229				5,751 to 8,200
.10	\$29,230 to \$29,370				> 8200

Different strategies for rounding the values contained in the price component table can have a significant impact on the district index values that result, and consequently on the cost to the state. Figure 2.4.a illustrates the impact of updating the price component table depicted in Figure 2.2.1.b using the same sort of rounding that was used to construct the price component of the existing CEI. For a short discussion of how a different rounding strategy would affect the construction of an updated price component, see Appendix B.

2.4.1 Issues to Consider in Updating the Existing CEI

Two points illustrate the limitations of the existing CEI. First, the existing CEI only includes the uncontrollable factors that were found to have an impact on teacher salaries in 1990. Our analysis found that not all of the factors included in the calculation of the existing CEI are still statistically significant. More importantly, the existing CEI leaves out several factors, such as teacher certification status, that have an impact on the cost of hiring teachers. In particular, the existing CEI omits community characteristics that influence teachers' willingness to live and work in an area, such as the average price of a house. Beginning competitive teacher salary is the only community characteristic included in the existing CEI. However, significantly more data are available now than were available when the existing CEI was constructed in 1990.

Funding simulations

According to an analysis conducted by the school finance division of the Texas Education Agency, implementing the updated CEI would require a total annual increase in state aid to school districts of between \$296 million and \$368 million, depending upon how the index values were rounded. On the average, major urban districts and major suburban districts would be the primary beneficiaries of updating the existing CEI. Major urban and suburban districts would receive total projected increases in state aid of at least \$87 million and \$134 million respectively. From a regional perspective, districts in Region I (Edinburg) and Region XVI (Amarillo) would receive somewhat less state aid than under current law, with total projected decreases of no more than \$7.1 million and \$9.4 million respectively. It is important to note that this analysis is based on the assumption that the updated CEI would be applied to the Foundation School Program in the same way that the existing CEI is applied. For example, the new index would be applied to seventy-one percent of the Basic Allotment, and fifty percent of the effects of the CEI would be applied in determining a district's count of students in Weighted Average Daily Attendance (a component in the calculation of Tier 2 state aid). The updated CEI can easily be made revenue-neutral by adjusting the percentages in the current finance formulas to which the CEI is applied.

¹ Multiple regression is a mathematical model that takes account of the effect of more than one independent factor or variable on a dependent variable. In the case of the 1990 CEI, the dependent variable was teacher salaries.

² Tax effort is not the same as tax rate. A district's tax effort is calculated on the basis of its tax collections divided by the Comptroller's certified taxable property values.

³ Districts can also levy taxes to pay existing debt (Interest and Sinking or I&S taxes), but the state provides a different level of support for a district's I&S tax effort.

⁴ Charter schools are not subject to the state salary scale, making charter school personnel unrepresentative of the teaching population.

⁵ Beginning teachers at these districts were included in the calculation of beginning teacher salaries in contiguous counties, however.