Illinois Education Research Council

Bringing Research to Policy and Practice

POLICY RESEARCH REPORT: IERC 2005-1

The Distribution of Teacher Quality in Illinois

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When the Illinois Education Research Council was founded in 2000, one of the first challenges it was given was to "find out who our teachers are." We also heard that "there is a lot of data out there that are not being used." So we connected the dots, obtained a copy of the Teacher Service Record file from the Illinois State Board of Education through a shared data agreement, and began the task of examining the measurable characteristics of Illinois public school teachers that have been shown in other national studies to be associated with student outcomes. In this study, we look at the distribution of all 140,000 teachers in 2002-2003 among Illinois' public schools using five teacher attributes that have been shown in previous research to be related to student performance and for which we were able to obtain data - college competitiveness, years of experience, type of credential, performance on the Basic Skills test and ACT score.

We created a composite measure of school teacher quality that we named the *Teacher Quality Index (TQI)* using a statistical procedure called principal components analysis to combine these teacher quality characteristics plus ACT English scores into a standardized index. We use a school's TQI as an indicator of average teacher quality at that school.

We found that teacher quality is distributed unevenly across schools in Illinois. However, *most of the variation is found among schools within districts*, suggesting that differences in the attractiveness of schools as workplaces are largely responsible for the systematic sorting of teachers that we see. Because of the size of the Chicago Public School District, we looked at it separately in this study. We found that CPS schools generally had much lower TQIs than schools in other urban areas, but that there was still wide variation of school TQI among the schools.[1]

More generally, we found that *students in high minority and high low-income schools throughout the state typically face teachers with lower quality attributes than their peers in other schools.* But we also found substantial variation in school TQI within these school-type categories, again indicating that *other characteristics of schools also affect teachers' decisions about where to work.* More research is needed to determine why schools that appear similar, at least in terms of the demographics of their students, attract qualitatively different teaching staffs. One-size-fits-all policies aimed at improving overall teacher quality, such as raising teacher salary levels for all teachers, will fail to address the systematic sorting of teachers among schools that exists within districts in Illinois. Rather, policies must be targeted to attract the highest quality teachers in a district or region to the neediest schools.

We recognize that the measures we are using in this study are input characteristics – not measures of individual teacher success. However, past research that informed our research design, and the results we present in this report, show that the teacher attributes we include are related to student performance. Additional research is underway at the IERC to examine in greater depth the relationship between school TQI, student demographics and student performance. In the meantime, although this research report falls short of establishing a causal link between the measurable quality attributes of teachers that we used in this study and student performance, it provides strong evidence that they are associated. Thus it would seem prudent for districts and schools to place more weight on these attributes during their consideration of prospective teachers.

[1] In another forthcoming policy research report, we will show that elementary / middle schools in four additional high-minority districts with enrollments of 10,000 or more students (East St. Louis, Cicero, Aurora East and Waukegan) had average school TQIs similar to or lower than CPS.

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About the Authors

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Highlights of Findings

Simple statewide averages of teacher quality attributes paint an inaccurate picture of teacher quality in different schools in Illinois. Some schools in the state employ a greater proportion of teachers with desirable attributes than other schools. This is true at both the elementary / middle and high school levels, as well as across and within geographic regions in the state.

The majority of the variation in schools' average teacher attributes in Illinois occurs among schools within districts in the state. This suggests that while a district hires teachers with a range of quality attributes, some schools within the district over time employ teachers with more similar attributes, thereby creating differences among schools in the district in the average quality of their teachers.

An additional 20 to 30 percent or so of the variation in most of the attributes occurs among districts within regions, indicating that some districts within a geographic region are able to attract higher quality teachers than other districts in that region.

In general, only a small percentage of the variation in teachers' attributes occurs among regions in the state. This signals that the average characteristics of teachers tend to be fairly similar across different geographic regions in Illinois.

The fact that much of the variation in the measured quality attributes of teachers occurs among schools within districts suggests that differences in the attractiveness of schools as workplaces, rather than differences in teachers' salaries, are likely driving the sorting of teachers among schools within a district. This does not mean, however, that salaries are unimportant. In fact, salary differentials and other characteristics that tend to differ across districts, such as locale, hiring practices, and policies that impact teachers' working conditions, are likely responsible for the proportion of variance that occurs among districts within region.

Schools in Chicago stand out even among most other urban schools in the state in terms of the low average quality of their teachers as measured by the Teacher Quality Index. Urban schools at the low end of the school TQI range in the Northeast, Northwest, and Southwest regions are also disadvantaged relative to suburban and rural schools in those regions.

Available indicators of the characteristics of schools, such as school locale, percent minority and low-income students, and percent high-performing students, show that schools with relatively high concentrations of minority, low-income, and low-performing students generally do not employ teachers with high quality attributes. Students in such schools typically face lower quality teachers than their peers in schools with higher percentages of non-minority, higher-income, and high-performing students. The fact that substantial variation in teacher quality also exists within these school-type categories, however, indicates that other characteristics of schools also affect teachers' decisions about where to work.

More research is needed to determine why schools that appear similar, at least in terms of the characteristics of their students, attract qualitatively different teaching staffs.

Teacher Quality and Student Achievement

Over the last 30 years, numerous studies have examined the association between measurable attributes of teachers, such as their number of years of teaching experience, and student outcomes in an effort to gain an understanding of what makes a high quality teacher. Two recent reviews of these studies (Rice, 2003; Wayne & Youngs, 2003) conclude that the following attributes of teachers make a difference for student achievement:

- *Ratings of Teachers' Baccalaureate Institutions:* Barron's *Profiles of American Colleges* ranks higher education institutions in the United States on a six-level competitiveness scale, ranging from most competitive to non-competitive.[2] An institution's ranking each year is based on a number of indicators of the academic quality of its freshman class, such as the percentage of applicants accepted for admission and the median SAT or ACT scores of the freshman class. Both of the reviews found that Barron's rankings are positively correlated with student achievement gains. Rice (2003) notes that the effect seems to be more pronounced at the high school than at the elementary school level. Moreover, low-income students at the elementary level appear to benefit more from having teachers who graduated from more competitive colleges than their higher income peers.

- *Teacher experience:* Rice (2003) found a positive relationship between years of teaching experience and student achievement outcomes, with the relationship most evident during the first three to five years of teaching in the elementary grades. At the high school level, her findings suggest that experience effects continue even later into teachers' careers. While Wayne & Youngs (2003) also report finding overall positive effects of experience on achievement, they conclude from their review that the non-linear nature of the relationship is difficult to interpret.

- *Advanced Degrees:* The single-salary schedule that is used by nearly all school districts to compensate teachers rewards them for their number of years of teaching experience and education credits beyond the bachelor's degree. Yet, studies examining the link between advanced degrees and student achievement have found conclusive results only for high school mathematics teachers with advanced degrees in math. More specifically, high school students appear to learn more in math from teachers with advanced math degrees. Results for other subjects and other grade levels are inconclusive at this time.

- *Subject-specific Teacher Certification:* Similar to the results for advanced degrees, both reviews found evidence of a positive relationship between teachers' mathematics certification and students' mathematics achievement at the high school level. The link between certification and student outcomes is less clear for other subject areas and, according to Rice's (2003) analysis, is not significant for reading and math at the elementary level.

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[2] Barron's includes specialty schools, such as art schools, in a seventh category called "Special". Because institutions in this seventh category, which constitute a very small number of schools, cannot be rank ordered like those in the other six categories, special institutions are excluded from the analyses in this study.

- *Teacher Test Scores:* Both reviews conclude that teachers' scores on college entrance exams, such as the ACT, and tests of verbal ability are positively linked to student outcomes, particularly for at-risk students. Rice (2003) notes, however, that the results are more mixed for teachers' performance on basic skills tests, like the National Teacher Examination.

- *Teacher Coursework:* Similar to the results for advanced degrees, coursework in pedagogy and the subject area of one's teaching has a positive impact on student achievement in math (and to a lesser extent science) at the high school level. Pedagogical coursework in math was also found to be significant for middle school students (Rice, 2003).

A 2002 study conducted using New York state data found that teacher quality attributes like those just described are distributed unequally across schools within and across geographic regions in New York. More specifically, the study found that low-income, minority, and low-performing students attend schools in which the teachers have less of the desirable attributes and more of the undesirable attributes than the teachers of their wealthier, non-minority, and higher performing peers (Lankford et al., 2002). Similar results were also found in California, where schools with high proportions of minority students employed at least five times the percentage of underprepared teachers (i.e., interns or teachers with emergency certificates or waivers) than schools with low proportions of minority students. Schools with high percentages of low-income students employed underprepared teachers at three to four times the rate of schools with low percentages of such students (Shields et al., 2003).

The purpose of this study is to examine the distribution of teacher quality attributes across schools within and across geographic regions in Illinois. The study replicates many of the analyses in the study by Lankford et al. (2002). We emphasize that the approach we are using measures only average teacher attributes in schools that have been found to be correlated with student outcomes in other studies. We refer to these characteristics as "teacher quality" but we recognize that there are other attributes related to good teaching that are not included because they are not currently measurable. We are not assessing characteristics of *individual teaching success*. While value-added studies (e.g., Sanders & Horn, 1998) have demonstrated that individual teachers can make an important difference to students' academic progress, those studies have yet to identify measurable characteristics of these successful teachers that can be examined on a large scale.

Data and Methods

Numerous data sources were employed in this study.[3] The population of 2002-2003 Illinois public school teachers was drawn from the Teacher Service Record (TSR) data maintained by the Illinois State Board of Education (ISBE). The TSR database contains rich information about all public school teachers employed in the state, such as their years of teaching experience, hours employed, the identity of the school in which they teach, position held, and main teaching assignment(s).

[3] The Illinois Education Research Council has a Shared Data Agreement with the Illinois State Board of Education to use these data, and is required to follow strict protocols to protect individually identifiable information. All reporting is done only on groups that are large enough to avoid identification of individual information.

For this study, data from the TSR were supplemented with Basic Skills certification test and baccalaureate college information from the Teacher Certification Information System (TCIS), which is also maintained by ISBE. Student performance data and teacher emergency / provisional credential information were obtained from the Illinois school report cards. Teachers' ACT scores were provided by ACT, Inc.[4] Barron's *Profiles of American Colleges* (2003) was used to obtain competitive rankings of teachers' baccalaureate colleges. Finally, the Common Core of Data compiled by the National Center for Education Statistics was accessed for information about Illinois school characteristics, including school locale, percent minority students, and percent low-income students.

Given the available data in Illinois, the following teacher quality indicators were constructed *for Illinois' schools*. Each measure is based on individual teacher information that was aggregated to the school level, unless indicated otherwise.

- *Percentage of teachers with bachelor's degrees from more-competitive colleges:* This measure includes teachers who graduated from institutions ranked in the top three (out of six) Barron's competitiveness categories - most competitive, highly competitive, and very competitive.
- *Percentage of teachers with less than 4 years of teaching experience:* A teacher's total years of experience, including years of teaching outside of Illinois public schools, are considered for this measure. Thus, the percentage for each school includes only those teachers who had 3 or fewer years of total teaching experience.[5]
- *Percentage of teachers with emergency or provisional credentials*: This measure is simply the school-level data that are self-reported by schools in the Illinois School Report Cards.
- *Percentage of teachers who failed the Basic Skills Test on the first attempt:* The percentage is based only on those teachers within each school who took the Basic Skills test, which was required for certification beginning in 1988.
- *Average ACT composite score of teachers* [6]
- *Teacher Quality Index (TQI):* The TQI is a composite measure of teacher quality that was constructed using principal components analysis, a statistical technique in which the aforementioned average teacher quality

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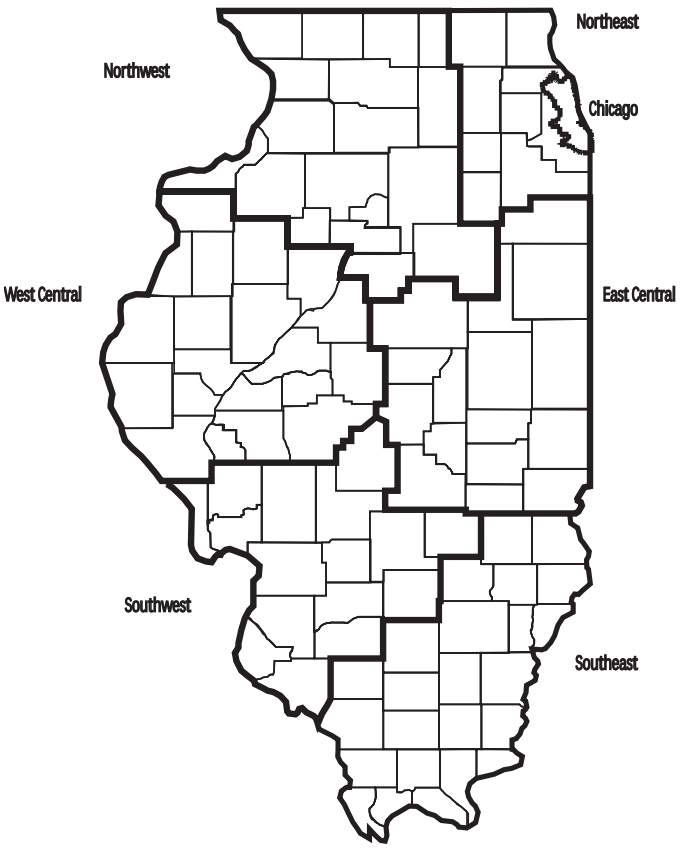
[4] The Illinois Education Research Council also has a Shared Data Agreement with the Illinois State Board of Education and ACT, Inc. to employ the ACT information. As with the ISBE data, the IERC is required to follow strict protocols with the ACT data to protect individually identifiable information.

[5] We were informed that the Chicago Public Schools district does not keep track of their teachers' years of experience outside of the district. Thus, this measure underestimates the total years of experience of CPS teachers who began their teaching careers in schools outside of Chicago.

[6] The IERC has ACT composite scores for about 80 percent of Illinois' teachers with five or fewer years of teaching experience. The percentage of teachers for whom we have ACT composite scores drops to 65, 50, 30, and 1 percent for teachers with 6 to 10, 11 to 15, 16 to 20, and 20 or more years of teaching experience, respectively. Thus, the average ACT score for a school with a more experienced teaching staff is likely somewhat less representative than that for a school with a less experienced teaching staff.

characteristics were combined into a standardized index. The TQI was created in an effort to reduce the multiple indicators of teacher quality into a single measure of teacher quality *for each school*. The teacher quality indicators that comprise the TQI include all of the aforementioned variables plus the average ACT English scores of teachers. The variables were chosen to maximize the percentage of variation in the component indicators explained by the index. The standardized scoring coefficients for the TQI components were as follows: average Barron's competitive ranking of teachers' undergraduate institution 0.520; the percentage of teachers with less than 4 years of experience -0.044; the percentage of teachers who failed the Basic Skills test on the first attempt –0.691; the percentage of teachers with emergency or provisional credentials –0.577; and the average ACT composite and English scores of teachers 0.861 and 0.859, respectively. These scoring coefficients indicate that the experience, Basic Skills test, and certification measure contribute negatively to the Index, whereas the Barron's ranking and ACT composite and English score measures contribute positively to the TQI. As constructed, the TQI accounts for 42.7 percent of the variation in the individual characteristics that comprise the index. By design, the TQI for Illinois has a mean of zero and a standard deviation of one. Thus, a school with a TQI of zero has teachers of average quality, whereas a school with a TQI of –2.0 employs teachers whose average quality falls two standard deviations below the mean of all schools in Illinois.

Figure 1



To examine the distribution of these teacher quality attributes across schools, school-level means were calculated for each attribute, including the TQI. This produced close to 3900 data points for each attribute, one for each school in the state. The distributions of these school means for the state as a whole, for seven separate regions in the state, and for different school types in each of the regions were then examined. Figure 1 shows a map of the seven regions examined in the state. These regions, which include the Northeast, Chicago, Northwest, East Central, West Central, Southeast and Southwest, were delineated to coincide with the six areas into which educational offices are grouped in Illinois.[7]

Because the distributions of school means for these characteristics tend to have a fair degree of variance, three points within each distribution – namely the 10th percentile, the 50th percentile, and the 90th percentile – are presented to enable the reader to see more clearly how these attributes are distributed across schools. Additional information about how to interpret these percentiles is provided later in the paper.

[7] The Chicago Public Schools (CPS) District constitutes the Chicago region. Chicago and CPS are used interchangeably throughout this study.

Four school-type variables were defined so that the distribution of teacher quality could be examined across schools with different characteristics.

- *Locale of the school*, based on U.S. Census definitions of the population density where the school is located. Locale information was obtained from that National Center for Education Statistics' Common Core of Data (CCD) and was adapted to include four locale types: urban, suburban, town and rural.[8]
- *Percent minority students*, as measured by the percentage of students enrolled in the school that is non-white.
- *Percent low-income students*, as measured by the percentage of students enrolled in the school that is eligible for free- or reduced-price lunch.
- *Percent high-performing students*, as measured by the percentage of students who met or exceeded standards on the Illinois Standards Achievement Test (ISAT) at the elementary / middle school levels or the Prairie State Achievement Examination (PSAE) at the high school level. [9]

For the percent minority and percent low-income measures, schools in the state or in each region were grouped into quartiles based on the percentage of students with the relevant characteristics in the schools. In the state-level analyses, the quartiles were defined on the basis of all schools in the state. In the regional analyses, the quartiles were defined *within* region so that the quartiles represent the *relative* school type in that area. The rationale for differentiating schools by their characteristics within region stems from recent evidence showing that the vast majority of teachers choose where to work among districts and schools within a relatively small geographic area, most often close to where they either grew up or attended college (Boyd et al., 2003). Thus, the relative quality of schools within a geographic area is likely more important to teachers' decisions about where to work than the relative quality of schools across the state. The analysis of percent high-performing students, in contrast, employed a state-level, rather than regional-level, measure of student performance.

Because we are using population data in this study, tests of statistical significance are not needed. All differences between teachers and schools reported in this study reflect actual differences during the 2002-2003 academic year.

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[8] The locale variable on the CCD contains eight categories: large central city, mid-sized central city, urban fringe of large city, urban fringe of mid-size city, large town, small town, rural outside Metropolitan Statistical Area (MSA), and rural inside MSA. For this study, the two city categories were combined and designated as 'urban', the two urban fringe categories as 'suburban', the two town categories as 'town', and the rural categories as 'rural'.

[9] The ISAT composite and PSAE composite scores, which are reported on the Illinois School Report Card data file, are used in this analysis.

How Do Illinois' Teachers Measure Up?

We begin our analysis of the distribution of teacher quality by describing for the state as a whole how Illinois' public school teachers measure up on the attributes that we have identified as being related to student success. In 2002-2003, Illinois employed over 140,000 public school teachers (Table 1). Nearly 71 percent of the teachers worked in elementary and middle schools, while about 29 percent worked in high schools. Just over twenty-two percent of Illinois' teachers overall received their baccalaureate degrees from colleges ranked most, highly, or very competitive by Barron's *Profiles of American Colleges*, although high school teachers (26.9%) were more likely than elementary / middle school teachers (20.4%) to graduate from such institutions. About one in five Illinois teachers (18.5% overall) at both the elementary / middle and high school levels in 2002-2003 had less than four years of teaching experience. The school average percentages of teachers with emergency or provisional credentials were reported by schools to be 2.6 and 1.9 for elementary / middle schools and high schools, respectively. A slightly greater proportion (4.6%) of elementary / middle school teachers than high school teachers (3.1%) failed the Basic Skills test on their first attempt. Finally, the average ACT composite score of teachers was 21.5 for teachers overall (21.0 and 22.8 for elementary / middle and high school teachers, respectively). To the extent that these attributes reflect the quality of teachers, the figures in Table 1 suggest that high school teachers on average are of higher quality than elementary / middle school teachers in the state, a finding which coincides with evidence at the national level (Lee et al., 2001).

Table 1. Quality Attributes of 2002-2003 Illinois Public School Teachers

	All	Elementary/ Middle School	High School
Number of Teachers	140,668	99,600	41,068
% of teachers with BA degrees from more-competitive colleges	22.3%	20.4%	26.9%
% of teachers with less than 4 years of teaching experience	18.5%	18.5%	18.4%
% of teachers with emergency or provisional credentials	2.4%	2.6%	1.9%
% of teachers who failed Basic Skills Test on first attempt	4.2%	4.6%	3.1%
Average ACT composite score of teachers	21.5	21.0	22.8

Note: The Teacher Quality Index (TQI) is a school-level measure and, hence, is not available at the teacher level.

Do Different Types of Schools Have Teachers with Different Quality Characteristics?

In the rest of the report, we examine how teachers with different quality attributes are grouped together in different types of schools. In order to reduce the multiple indicators of teacher quality that we showed in Table 1 to make the analysis somewhat more straightforward, we created a single school-level indicator of the average teacher quality characteristics that we refer to as the Teacher Quality Index (TQI). The method we used to create the TQI is explained in the Data and Methods section. The box on this page explains how to interpret the values of the TQI. We encourage you to take a moment to examine this box before you proceed and to use the look-up table (Table A1 in the appendix) for reference.

The average statewide figures for Illinois teachers' quality attributes shown in Table 1 conceal considerable variation in how teachers with different attributes are grouped together in individual schools across the state. In Table 2, the distribution of school-level averages are reported for elementary / middle schools

Interpreting the Teacher Quality Index

Each school has its own Teacher Quality Index (TQI) value. This is a weighted average of the quality attributes of teachers at that school. We have scaled the TQI so that it has an overall mean for all schools combined of 0.0 and a standard deviation of 1.0. (The TQIs for high schools turn out to be somewhat higher — they have teachers with more of the desirable attributes — so the mean for high schools is 0.5.) The value on the TQI scale gives you an idea of how different from the average school another school is. The higher or lower the number, the more different the school is. The table below shows that most schools fall between ±1 of the average school. A TQI value that falls outside this range is quite different (one standard deviation or more different) from the average school. And TQI values that are ±2 or more (less than -1.5 or more than 2.5 for high schools) differ from the average schools by two standard deviations or more, which makes them very different from the average school. The table shows that only a very small percentage of schools falls more than 2 standard deviations above or below the average school.

We also use the difference between two TQI values to assess the degree of dispersion on the TQI scale. For example, a difference of 1.5 means that the two schools differ by 1.5 standard deviations from each other – which is quite large. In contrast, a difference of, say, 0.5 standard deviations means that the schools being compared are quite similar to one another.

Number of schools by TQI range and school level

TQI Range	Less than –2	-2 to -1	-1 to 0	0 to +1	+1 to 2	Greater than 2
Number of schools						
E/M school	164	320	924	1375	262	17
High school	5	25	106	333	157	6
All schools	169	345	1030	1708	419	23
% Distribution						
E/M school	5%	10%	30%	45%	9%	1%
High school	1%	4%	17%	53%	25%	1%
All schools	5%	9%	28%	46%	11%	1%

We sorted schools based on their TQI and provide a look-up table in the Appendix (Table A1) that shows what percentage of schools have TQIs that are equal to or higher than a specific TQI and what percentage of schools have lower TQIs. Table A1 has columns for (1) all schools combined, (2) elementary/middle schools, and (3) high schools.

and high schools. Focusing first on the TQI, 10 percent of elementary / middle schools in Illinois employ teachers with an average TQI of at least -1.4, while teachers in another 10 percent of such schools in the state (i.e., those at the 90th percentile) have an average TQI of at least 1.0. At the high school level, the average TQI of teachers ranges from -0.4 or less for the bottom 10 percent of schools to 1.4 or more for schools at the 90th percentile. Similarly, whereas in 10 percent of Illinois' elementary / middle schools fewer than 1 in 20 teachers (4.1% at the 10th percentile) have less than 4 years of teaching experience, in another 10 percent of elementary / middle schools at least 1 in 3 teachers (33.3% at the 90th percentile) have less than 4 years of experience. Finally, although just 3.1 percent of Illinois high school teachers overall failed the Basic Skills test on their first try, at least 50 percent of high schools in the state employ no teachers who failed the test (0.0% at the 50th percentile for high schools in Table 2). In ten percent of the state's high schools, however, about 1 in 10 (9.5%) or more of the teachers failed the Basic Skills test at least once.

Table 2. School Quantiles for Illinois Teacher Quality Attributes by School Level

Quality Attribute	Elementary/Middle Schools				High Schools			
	Statewide Teacher Average	School Percentile Distribution			Statewide Teacher Average	School Percentile Distribution		
		10th	50th	90th		10th	50th	90th
Teacher Quality Index (TQI)	--	-1.4	0.1	1.0	--	-0.4	0.6	1.4
% of teachers with BA degrees from more-competitive colleges	20.4%	0.0%	16.7%	37.0%	26.9%	0.0%	17.7%	38.3%
% of teachers with less than 4 years of teaching experience	18.5%	4.1%	16.0%	33.3%	18.4%	7.1%	16.7%	30.0%
% of teachers with emergency or provisional credentials	2.6%	0.0%	0.0%	8.0%	1.9%	0.0%	0.0%	5.3%
% of teachers who failed Basic Skills Test on 1st attempt	4.6%	0.0%	0.0%	13.3%	3.1%	0.0%	0.0%	9.5%
Average ACT composite score of teachers	21.0	18.5	21.0	22.9	22.8	20.5	22.4	24.1

Distribution of Teacher Attributes by Region

Illinois has the fourth largest school population in the nation, and its schools are spread over an area of 55,593 square miles. Because the data set we are using consists of the population of public-school teachers in 2002-2003, the numbers are large enough for us to be able to make comparisons among schools that are located in the different regions of the state. We are using the six educational regions plus Chicago to begin an examination of differences between types of schools (for more information on the regions, and a map, see Data and Methods section).

Table 3 shows the number of schools by TQI range and school level in the seven regions. It is clear that different regions have schools that are distributed quite differently on the TQI scale. But what is also clear from the table is that within each region, there are schools whose TQIs are quite different from one another. The Northeast, for example, has 18 elementary / middle schools with TQIs of less than –2, and 4 schools with TQIs that are greater than +2 — a spread of more than 4 standard deviations.

How to Read the Tables

Because we are interested in the variation in how teachers are grouped together in individual schools across the state, the "average" is not a good measure. It does not tell us how schools are different from one another. Instead, each table shows values for schools that are at the 10th percentile (i.e., lower than 90% of schools), in the middle (the 50th percentile, or median), and at the 90th percentile point of the distribution of the schools for a particular attribute.

Let's look at the first row in Table 2, which shows the variation in schools' TQIs. The results are shown separately for elementary/middle schools and high schools. After sorting all elementary/middle schools by their TQI, the elementary/middle school whose TQI placed it at the 10th percentile has a TQI of –1.4. The school at the 50th percentile has a TQI of 0.1. The elementary/middle school whose TQI placed close to the top – at the 90th percentile among all elementary/middle schools – has a TQI of 1.0. This result also tells us that about 40% of elementary/middle schools have TQIs between 0.1 and 1.0, while another 40% have TQIs between –1.4 and 0.1.

The next row shows us how schools differ with regard to the percentage of their teachers who have BA degrees from more-competitive colleges. Here we sorted elementary/middle schools by the percent of their teachers with BA degrees from more-competitive colleges, and picked out the schools that fell at the 10th percentile, the 50th percentile and the 90th percentile. Their values on this attribute were 0.0% (no teachers with BA degrees from more-competitive colleges), 16.7% of teachers with BA degrees from more-competitive colleges, and 37% of teachers with BA degrees from more-competitive colleges, respectively. This methodology was repeated for each of the other attributes in the table, and for high schools.

Table 3. Number of Schools by TQI Range, Region, and School Level						
	TQI Range					
Region	Less than -2	-2 to -1	-1 to 0	0 to 1	1 to 2	Greater than 2
Elementary/Middle Schools						
Northeast (less CPS)	18	71	321	619	144	4
Chicago	131	184	125	44	5	0
Northwest	2	11	108	210	26	0
East Central	2	12	67	154	46	7
West Central	1	7	99	166	31	4
Southeast	0	7	65	80	6	2
Southwest	10	28	139	102	4	0
High Schools						
Northeast (less CPS)	0	0	10	69	63	4
Chicago	3	23	21	20	2	0
Northwest	0	0	5	55	29	1
East Central	0	0	11	51	29	1
West Central	0	0	16	56	25	0
Southeast	0	1	23	29	7	0
Southwest	2	1	20	53	2	0

In order to measure the distribution of TQI and other teacher quality attributes more systematically, we examined the values for schools that are at the 10th percentile (i.e. lower than 90% of schools), in the middle (the 50th percentile, or median), and at the 90th percentile point of the distribution of the schools for a particular attribute (see the insert box for further explanation). Table 4 shows the distribution of teacher attributes across schools in each of the seven geographic regions. Similar to the previous results, the average quality attributes of teachers varies among schools both across and within regions. Schools in Chicago, for example, tend to have teachers with lower average quality attributes at each level of the distribution

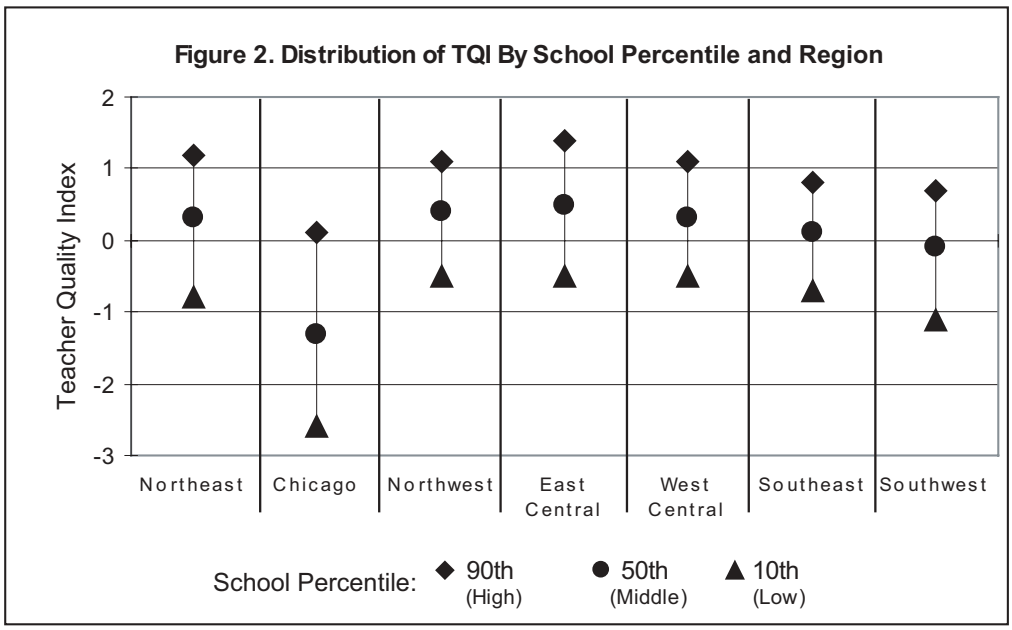
Table 4. School Quantiles for Illinois Teacher Attributes by Region

	School Percentile	Northeast (less CPS)	Chicago	Northwest	East Central	West Central	Southeast	Southwest
Teacher Quality Index (TQI)	10th	-0.8	-2.6	-0.5	-0.5	-0.5	-0.7	-1.1
	50th	0.3	-1.3	0.4	0.5	0.3	0.1	-0.1
	90th	1.2	0.1	1.1	1.4	1.1	0.8	0.7
% of teachers with BA degrees from more-competitive colleges	10th	9.5%	13.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	50th	22.6%	28.0%	13.5%	11.2%	12.9%	2.0%	4.8%
	90th	40.0%	45.2%	26.3%	33.3%	30.8%	11.8%	13.3%
% of teachers with less than 4 years of teaching experience	10th	8.9%	5.6%	2.4%	3.2%	0.0%	0.0%	0.0%
	50th	20.0%	16.4%	13.8%	14.3%	13.6%	11.1%	12.0%
	90th	35.9%	30.7%	30.0%	29.0%	27.7%	25.0%	27.1%
% of teachers with emergency or provisional credentials	10th	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	50th	0.0%	6.8%	0.0%	0.0%	0.0%	0.0%	0.0%
	90th	5.4%	18.2%	3.4%	0.0%	0.0%	0.0%	0.0%
% of teachers who failed Basic Skills test on 1st attempt	10th	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	50th	0.0%	10.5%	0.0%	0.0%	0.0%	0.0%	0.0%
	90th	10.3%	22.2%	7.0%	6.3%	6.7%	7.1%	6.3%
Average ACT composite score of teachers	10th	19.6	17.0	19.5	19.3	19.5	18.9	18.6
	50th	21.6	19.5	21.4	21.6	21.2	20.8	21.0
	90th	23.4	22.0	23.2	23.8	23.6	22.7	22.9

(10th, 50th and 90th percentiles) than schools in the other regions of the state, although one exception stands out. Schools in Chicago and in the greater Northeast region are more likely to have teachers who graduated from more-competitive colleges compared to schools in the other regions. This is most likely due to the distribution of colleges and universities in Illinois, where four of the seven institutions in the state ranked by Barron's as "very competitive" or higher are located in Chicago and the Northeast region.

The numbers in Table 4 also show significant variation in schools' average teacher attributes *within* regions in the state. In 10 percent of the schools in the Northeast region (i.e., the 10th percentile schools), for example, fewer than 1 in 10 teachers (8.9%) have less than four years of experience, whereas in another 10 percent of schools in that region (i.e., the 90th percentile schools), more than 1 in 3 teachers (35.9%) have less than four years of experience. Similarly, 10 percent of the Chicago Public Schools employ no teachers who failed the Basic Skills test on the first attempt, whereas another ten percent have at least one in five (22.2%) such teachers.

Figure 2 is a graphical representation of one of these indicators - the TQI - by region. The figure shows that there exist at least 1.5 TQI points (1.5 standard deviations) of difference in average teacher quality, as measured by the TQI, between 10th percentile schools and 90th percentile schools *within every region* in Illinois. The differentials are especially pronounced among schools in Chicago, where almost 3 TQI points (3 standard deviations) separate the 10th and 90th percentile schools. Schools' average TQIs also vary *across regions*. Schools in the southern portion of the state employ teachers whose quality attributes average out somewhat lower than those in the central and northern areas of the state, although Chicago schools generally have the lowest average teacher quality values. As shown in Figure 2, the 90th percentile schools in Chicago(TQI = 0.1) employ teachers with average TQIs that are lower than the averages of the 50th percentile schools in the northern and central regions.



HOW TO READ THE FIGURES

Each vertical line in the figure shows the average TQI values for schools at the 10th (triangle), 50th (circle), and 90th (diamond) percentiles within each region. The vertical length of each line depicts the degree of variation in the distribution of the TQI across schools *within a particular region* – the shorter the line, the lower the variation across schools in the region. The horizontal positioning of the vertical lines, in contrast, shows the distribution of schools' different TQIs *across the regions*. In this case, the vertical lines of regions that have schools with higher (more positive) average values of TQI are positioned higher in the figure than those of regions that have schools with lower average values of TQI.

Taken together, Tables 2 and 4 and Figure 2 show that simple statewide averages of teacher quality attributes paint an inaccurate picture of teacher quality in different schools in Illinois. The results indicate that some schools in the state employ a greater proportion of teachers with desirable attributes than other schools. This is true at both the elementary/middle and high school levels, as well as across and within geographic regions in the state. Later, we take a closer look at the characteristics of schools to determine which schools are able to employ teachers with more desirable attributes.

Regional, District and Within-District Differences in Schools' Average Teacher Quality Attributes

While a district hires teachers with a range of ACT composite scores, some schools within the district over time employ teachers with more similar scores, thereby creating differences among schools in the district in the average scores of their teachers.

The question we address now is at what level (region, district, or within district) the differences that we see in schools' teacher quality attributes are most pronounced. Using a statistical procedure called variance decomposition, we were able to break the total variation that was shown in each of the quality attributes above into three levels: (i) among regions, (ii) among districts within regions, and (iii) among schools within district. For this analysis, Chicago is included as a district in the Northeast region rather than considered separately so that the variation associated with the district is attributed to the correct level.[10] The numbers in parentheses reflect the variance decomposition results when Chicago is excluded from the decomposition altogether.

Considering all schools together, Table 5 shows that the majority of the variation in schools' average teacher attributes in Illinois occurs *among schools within districts* in the state, regardless of whether Chicago is included or excluded from the analysis. For example, 71.5 percent of the variation in schools' average ACT composite scores of their teachers is found among schools within districts (77.0% when Chicago is excluded). *In simple terms, this suggests that while a district hires teachers with a range of ACT composite scores, some schools within the district over time employ*

TQI Variance Decomposition

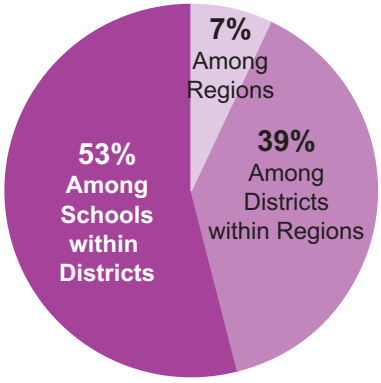


Table 5. Variance Decomposition for Illinois Teacher Quality Attributes

	Variance Decomposition (%) *		
Quality Attribute	Among Regions	Among Districts within Region	Among Schools within District
Teacher Quality Index (TQI)	7.4% (5.8%)	39.2% (31.0%)	53.4 % (63.1%)
% of teachers with BA degrees from more-competitive colleges	38.8% (35.5%)	24.5% (32.5%)	36.7 (32.0%)
% of teachers with less than 4 years of teaching experience	8.7% (11.4%)	22.8% (24.1%)	68.5 (64.4%)
% of teachers with emergency or provisional credentials	15.3% (6.6%)	17.9% (19.9%)	66.8 (73.4%)
% of teachers who failed Basic Skills test on 1st attempt	11.0% (2.6%)	19.0% (14.1%)	70.0 (83.2%)
Average ACT composite score of teachers	1.5 (3.0)	27.1 (20.0%)	71.5 (77.0%)

*Percentages in parentheses exclude Chicago from the Northeast region.

[10] Because Chicago is included as a district, six regions are considered in this analysis: Northeast, Northwest, East Central, West Central, Southeast, and Southeast. The map in Figure 1 outlines the boundaries of these regions.

teachers with more similar scores, thereby creating differences among schools in the district in the average scores of their teachers. An additional 20 to 30 percent or so of the variation in most of the attributes occurs among districts within regions, which indicates that some districts within a geographic region are able to attract higher quality teachers than other districts in that region. In general, only a small percentage of the variation in teachers' attributes occurs among regions in the state, which signals that *the average characteristics of teachers tend to be fairly similar across the different geographic regions in Illinois*. One notable exception involves the percentage of teachers with BA degrees from more-competitive colleges. On that measure, more than a third of the variation (38.8% including Chicago, 35.5% excluding Chicago) exists among regions in the state, presumably due to the uneven geographic distribution of more-competitive colleges and universities across Illinois. Tables A2 and A3 in the appendix display the results for elementary/middle schools and high schools, respectively. While the results for elementary/middle schools are very similar to those shown in Table 5, the results for high schools are quite different when Chicago is excluded. This is due to the prevalence of single-school high school districts in the state. In that case, the majority of the variation in schools' average teacher attributes is found among these single-school districts within each of the six geographic regions.

Differences in the attractiveness of schools as workplaces, rather than differences in teachers' salaries, are likely driving the sorting of teachers among schools within a district.

As Lankford et al. (2002) point out, these decomposition results have strong implications for the policy responses that might be considered to address the unequal distribution of teacher quality in Illinois. Because teacher salaries are set for all teachers within a district at the district level, the finding that much of the variation in these measured quality attributes of teachers occurs among schools within district suggests that differences in the attractiveness of schools as workplaces, rather than differences in teachers' salaries, are likely driving the sorting of teachers among schools within a district. This does not mean, however, that salaries are unimportant. In fact, salary differentials and other characteristics that tend to differ across districts, such as locale, hiring practices, and policies that impact teachers' working conditions, are likely responsible for the portion of variance that occurs among districts within a region. To put it another way, inter-district salary differences appear to be less important to the sorting of teachers than the lack of intra-district salary differences that could be used to compensate for differences in working conditions among schools in a district. Holding salary constant, working conditions make a difference.

In the next section, we examine the impact of four different school characteristics on the distribution of teacher quality in schools within and across regions in the state.

Distribution of Teacher Quality Attributes By School Characteristics

Chicago stands out even among most other urban schools in the state in terms of the low average quality attributes of their teachers as measured by the TQI.

Locale. Locale refers to the urbanicity of the geographic area in which a school is located (see footnote 8 for an explanation of the locale categories). In the New York study by Lankford et al. (2002), schools in urban areas, and in New York City in particular, were found to be more disadvantaged in terms of the quality of their teachers than schools in suburban and rural areas. Table 6 shows the school TQI at the 10th, 50th, and 90th percentiles in the state and in each of the seven regions in the state by locale. Table A4 in the appendix provides complete information for all of the quality attributes by locale. As shown in Table 6, *schools in Chicago stand out even among most other urban schools in the state in terms of the low average quality attributes of their teachers as measured by the TQI.*[11] In Chicago, schools in the bottom 10th percentile employ teachers whose average TQI falls *at least* 2.6 standard deviations below the average TQI of all schools in Illinois. This places these schools in the lowest 2% of schools statewide. Among Chicago's 90th percentile schools, which represent the 10 percent of schools in the district with the highest average quality of teachers for that particular attribute, the TQI for teachers in Chicago lies just above (0.1) the state average. *Schools in the lowest 10% of urban schools in the Southwest, Northeast and Northwest regions are also disadvantaged relative to suburban and rural schools in those regions.* The TQIs of urban schools in other regions in the state, in contrast, are quite similar to those of schools in other locales in those regions. In some instances, most notably the teachers' baccalaureate college measure, rural schools rank lower than urban and suburban schools in the same region (see Table A4 in the appendix).

Perhaps most surprising, although consistent with the variance decomposition results in the previous section, is the tremendous variation in teacher quality that exists within the locale category within each region. The teachers employed by

Table 6. School Percentiles for Teacher Quality Index (TQI) by Region and Locale

	School Percentile	Illinois	Northeast (less CPS)	Chicago	Northwest	East Central	West Central	Southeast	Southwest
All Locales	10th	-1.3	-0.8	-2.6	-0.5	-0.5	-0.5	-0.7	-1.1
	50th	0.1	0.3	-1.3	0.4	0.5	0.3	0.1	-0.1
	90th	1.1	1.2	0.1	1.1	1.4	1.1	0.8	0.7
Urban	10th	-2.3	-1.3	-2.6	-0.8	-0.2	-0.3		-2.2
	50th	-0.7	0.0	-1.3	0.3	0.5	0.2		-0.6
	90th	0.7	0.9	0.1	0.9	1.7	0.8		0.2
Suburban	10th	-0.8	-0.8		-0.3	-0.3	-0.4		-1.0
	50th	0.3	0.3		0.3	0.6	0.5		-0.1
	90th	1.2	1.2		1.0	1.5	1.2		0.5
Town	10th	-0.5			-0.4	-0.4	-0.3	-0.6	-0.7
	50th	0.3			0.3	0.5	0.3	0.0	0.2
	90th	1.0			1.1	1.1	1.0	0.7	0.9
Rural	10th	-0.6	-0.4		-0.5	-0.6	-0.6	-0.7	-0.8
	50th	0.2	0.4		0.4	0.4	0.3	0.1	-0.1
	90th	1.1	1.0		1.1	1.4	1.2	0.9	0.7

[11] In another forthcoming policy research report, we will show that elementary / middle schools in four additional high-minority districts with enrollments of 10,000 or more students (East St. Louis, Cicero, Aurora East and Waukegan) had average school TQIs similar to or lower than CPS.

schools at the 10th percentile tend to be qualitatively different (i.e., have very different average quality attributes) from those working in the 90th percentile schools, regardless of whether the schools are located in urban, suburban, town, or rural areas. These findings suggest that a school's locale in and of itself cannot explain all of the inequities in teacher quality that exist across schools in Illinois.

Percent Minority Students in the School. Because labor markets for teachers have been found to be very localized in nature (Boyd et al., 2003), the relative attractiveness of schools as workplaces is likely assessed by teachers at a regional rather than state level. That is, teachers generally choose where to teach among schools within a fairly narrow geographic area, most often close to where they grew up or attended college. For this reason, school quartiles for this measure, as well as those for the low-income students measure that follows, are defined in this study *within* region so that the quartiles represent the *relative* school type in that region (Table 7, left panel). The quartiles in the left panel relating to percent minority students are presented in three categories:

Excluding Chicago, most schools in each region are about 20 percent or less minority and less than 50 percent low-income.

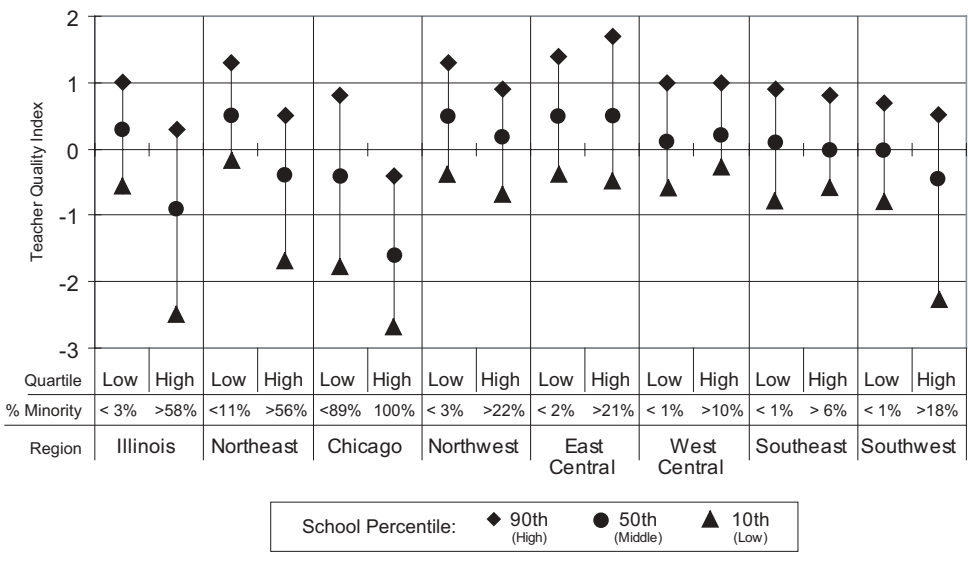
- Low (Quartile 1): the 25 percent of schools in each region with the lowest percentages of minority students
- Medium (Quartiles 2 and 3): the 50 percent of schools that fall into the second and third quartiles on this measure
- High (Quartile 4): the 25 percent of schools in each region with the highest percentages of minority students

Once again, Chicago stands out as an area in which the majority of schools enroll high concentrations of minority students and students identified as low-income. In the majority of schools in the other regions, no more than about 20 percent of the students are minority and less than 50 percent are low-income. The Northeast region lies in between in terms of the proportion of minority students in its schools.

Table 7. School Quartiles for Percent Low-Income Students and Percent Minority Students by Region

	Percent Minority Students			Percent Low-Income Students		
	Low	Medium	High	Low	Medium	High
Region	(Quartile 1)	(Quartiles 2 & 3)	(Quartile 4)	(Quartile 1)	(Quartiles 2 & 3)	(Quartile 4)
Illinois	< 3.3%	3.3 - 58.3%	> 58.3%	< 10.7%	10.7 - 55.1%	> 55.1%
Northeast (less Chicago)	< 11.1%	11.1 - 56.2%	> 56.2%	< 3.2%	3.2 - 30.9%	> 30.9%
Chicago	< 88.7%	88.7 - 99.9%	100.0%	< 83.2%	83.2 - 96.5%	> 96.5%
Northwest	< 2.7%	2.7 - 22.0%	> 22.0%	< 13.0%	13.0 - 35.8%	> 35.8%
East Central	< 1.8%	1.8 - 21.3%	> 21.3%	< 15.3%	15.3 - 41.1%	> 41.1%
West Central	< 0.7%	0.7 - 10.2%	> 10.2%	< 17.5%	17.5 - 42.4%	> 42.4%
Southeast	< 0.9%	0.9 - 6.0%	> 6.0%	< 28.6%	28.6 - 49.5%	> 49.6%
Southwest	< 1.1%	1.1 - 17.9%	> 17.9%	< 18.5%	18.5 - 45.2%	> 45.2%

Figure 3. Distribution of the TQI By Region and Percent Minority Students

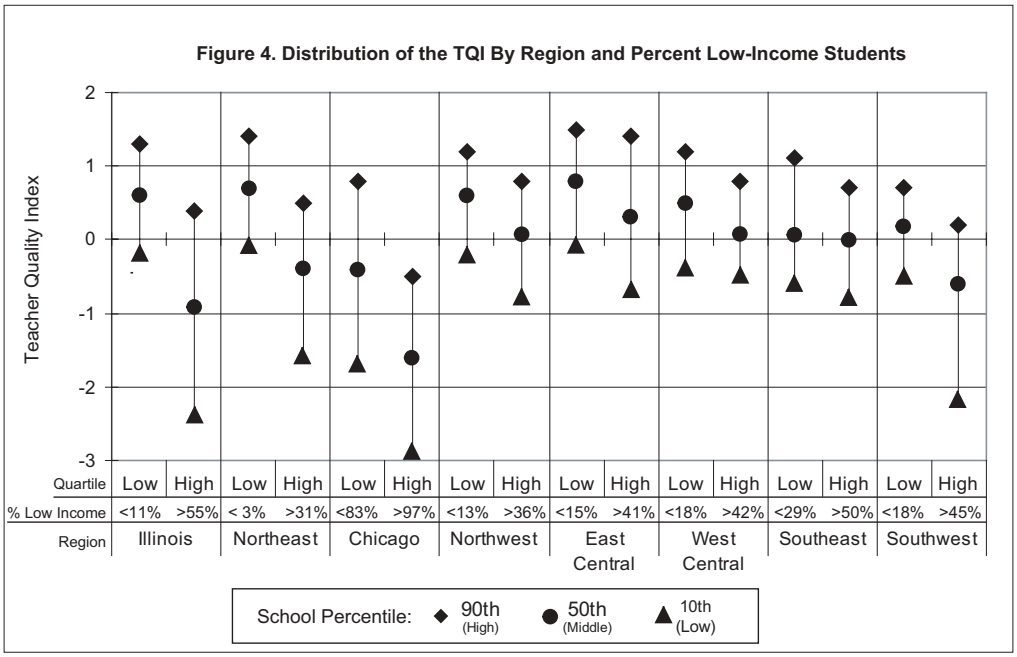


The results for the teacher experience measure (see Tables A4, A5, and A6) are noteworthy on account of the recent national attention given to the issue of teacher turnover. While one might conclude from the national focus that teachers are fleeing our schools, particularly those serving minority and disadvantaged students, the findings for Illinois indicate that teacher turnover, as measured by the percentage of teachers with less than 4 years of experience in the schools, is more of a challenge in some schools (i.e., 90th percentile schools) than in others (i.e., 10th percentile schools). This is the case within every region and school type, not simply among schools in urban areas or schools with high concentrations of minority or low-income students.

Figure 3 presents the TQI by school percentile (10th, 50th, and 90th) for schools with low and high percentages of minority students for the state as a whole and for each region. Schools with medium percentages of minority students are excluded from the figure due to space limitations, although all of the results for this and the other attributes are shown in Table A5 in the appendix. Figure 3 shows that the schools' TQIs are lower in regions with high percentages of minority students, including Chicago and the Southwest and Northeast regions' high-minority schools. Within regions, schools with relatively high percentages of minority students (high quartile 4) tend to employ lower quality teachers than schools in the same region with low percentages of such students, although this was not true in every region. Differences between low- and high-minority schools are generally less pronounced in the central and Southeastern areas of the state, most likely due to the fact that even their "high" minority schools enroll relatively low percentages of minority students (see Table 7).

As with the locale measure, tremendous variation in school TQI exists within minority-quartiles in each region. In the East Central region, for example, the average school TQI for schools with low percentages of minority students (< 1.8% minority enrollment) differs by more than a full standard deviation. The same is true in other regions and for each minority quartile. Similar results hold for the component attributes as well, as shown in Appendix Table A5.

Percent Low-Income Students in the Schools. The definitions of the quartiles for percent low-income students were presented in Table 7. Similar to Figure 3, the TQI results for schools in the low and high quartiles of percent low-income students for each region and Illinois are presented in Figure 4. Appendix Table A6 shows the results for all of the attributes by percent low-income quartile. As with percent minority students, these results indicate that the school TQIs vary across regions, within regions across school type (i.e., low and high percent low-income quartiles), and within regions within school type. Overall, schools in Chicago have lower TQIs than schools in other areas. Within region, schools with higher percentages of low-income students have lower TQIs than schools with lower percentages of



School TQI is lower in high minority and high low-income schools. But there is also great variation within school type.

these students. And in contrast to the findings for minority student enrollment, which showed some inconsistencies across regions, these within-region results for percent low-income students hold for every region in the state. Moreover, substantial variation is again shown within percent low-income quartile within region. In some instances (e.g., high percent low-income schools in the Northeast, Chicago, and the East Central and Southwest regions), more than two standard deviations in TQI exist between schools within the same low-income quartile and region. (see Table A6)

Percent High-Performing Students in the Schools. The final school indicator that we consider in this study is the performance level of students in each school. For this indicator, we examined the percentage of elementary / middle and high schools in a region scoring at or above the state-average percentage of students who met or exceeded standards on the Illinois Standards Achievement Test (ISAT) and the Prairie State Achievement Examination (PSAE), respectively (Table 8). The state average on the ISAT was 64 percent, while that on the PSAE was 53 percent. The percentage of schools meeting or exceeding the state average is not reported in cells containing less than 5 schools (see Table 3 for the number of schools in each cell). The rationale for using a state-level rather than regional-level performance average is that standards for student performance are the same for all schools across the state. Thus, it seemed most appropriate when considering student performance to utilize an absolute rather than a relative scale.

The results in Table 8 show a positive association between the TQI and the percentage of schools with at- or above- average percentages of high-performing students at both the elementary / middle school and high school levels. In general, schools with higher TQI levels are more likely to score at or above the state average on the ISAT and PSAE than schools with lower TQI levels. The relationship appears particularly strong in areas with relatively high concentrations of minority and economically disadvantaged students, such as Chicago and the Northeast

and Southwest regions. Both of these latter regions contain districts, East St. Louis in the Southwest being one example, with concentrations of disadvantaged students like that found in Chicago. Differences in schools' student performance levels by TQI are not quite as pronounced in the Northwest and East Central regions at the elementary / middle school level and in the Northwest and Southeast regions at the high school level, suggesting that the characteristics of students in a district or region may have a moderating effect on the link between teacher quality and student performance.

School TQI is associated with school performance on ISAT and PSAE, especially in areas with relatively high concentrations of minority and economically disadvantaged students, such as Chicago and the Northeast and Southwest regions.

These results, along with the existing literature reviewed in the first part of this paper, support an association between these teacher attributes and student performance. While it might be tempting to conclude that lower quality teachers are the cause of students' lower performance – especially in light of recent findings regarding the impact that teachers have on student learning (Sanders & Horn, 1998) – this study was not designed to, nor can it create such a causal link. That is, while the existing evidence suggests that some teachers produce greater gains in student achievement than others and that certain teacher attributes are correlated with high student achievement, we cannot establish from the findings in this study alone a causal link because there are other plausible interpretations of these findings. For example, conditions in the schools, such as school resources and leadership quality, can serve to intensify or ameliorate the capacity of teachers to achieve positive student outcomes. Since a clear-cut explanation for these findings is not yet known, we suggest that readers be conservative when inferring causal implications from this study.

Table 8. Percentage of Schools Scoring At or Above State Average on ISAT and PSAE by TQI Range, Region, and School Level *

	TQI Range					
Region	**Less than -2**	**-2 to -1**	**-1 to 0**	**0 to 1**	**1 to 2**	**Greater than 2**
Elementary/Middle Schools (ISAT)						
Northeast (less CPS)	6.6%	21.3%	50.8%	80.9%	94.4%	--
Chicago	0.1%	7.1%	21.6%	47.7%	80.0%	--
Northwest	--	54.6%	61.1%	67.6%	69.2%	--
East Central	--	58.3%	58.2%	71.4%	56.5%	71.4%
West Central	--	14.3%	58.6%	66.3%	80.7%	--
Southeast	--	28.6%	55.4%	63.8%	66.7%	--
Southwest	30.0%	53.6%	60.4%	77.5%	--	--
High Schools (PSAE)						
Northeast (less CPS)	--	--	20.0%	58.0%	98.4%	--
Chicago	--	0.0%	4.8%	26.3%	--	--
Northwest	--	--	60.0%	60.0%	89.7%	--
East Central	--	--	36.4%	66.7%	75.9%	--
West Central	--	--	25.0%	60.7%	72.0%	--
Southeast	--	--	30.4%	41.4%	28.6%	--
Southwest	--	--	25.0%	69.8%	--	--

* The state average percentage of students who met or exceeded standards on the ISAT was 64, while that for the PSAE was 53. Percentages are not reported for cells containing fewer than five schools.

Summary and Conclusions

Teacher quality, as indicated by measurable characteristics of teachers, is distributed unevenly across schools in Illinois. While a small amount of the total variation in teacher quality occurs among geographic regions in the state, a greater amount occurs among districts within the same region. Most of the variation, however, is found among schools within districts, suggesting that differences in the attractiveness of schools as workplaces are largely responsible for the systematic sorting of teachers that we see. The overall TQIs of schools in Chicago are generally much lower than those in the other regions, perhaps due to the concentration of low-income and minority students that sets the district apart from the other regions.

Available indicators of the characteristics of schools, such as school locale, percent minority and percent low-income students, and percent high-performing students, show that schools with relatively high concentrations of minority, low-income, and low-performing students generally do not employ teachers with high quality attributes. Students in such schools typically face lower quality teachers than their peers in schools with high percentages of non-minority, higher-income, and high-performing students. The fact that substantial variation in teacher quality also exists within these school-type categories (i.e., minority, low-income, and high-performing), however, indicates that other characteristics of schools also affect teachers' decisions about where to work. More research is needed to determine why schools that appear similar, at least in terms of the characteristics of their students, attract qualitatively different teaching staffs.

The results of this study suggest that more of the oft-used one-size-fits-all policies aimed at improving overall teacher quality, such as raising teacher salary levels for all teachers, will fail to address the systematic sorting of teachers among schools within districts in Illinois. Rather, policies must be targeted to attract the highest quality teachers in a district or region to the neediest schools, particularly in areas like Chicago that contain high concentrations of disadvantaged students (Lankford et al., 2002). While such policies might include monetary incentives, such as signing and retention bonuses and / or tax credits for teachers to work in specific schools, policies aimed at improving teachers' working conditions would likely have positive impacts as well. Finally, research has shown that districts do not necessarily favor the highest quality applicants, as measured by the academic ability-type indicators used in this study, when making hiring decisions (Ballou, 1996). Although this study falls short of establishing a causal link between these measurable attributes of teachers and student performance, it provides strong evidence that they are associated. Thus, it would seem prudent for districts and schools to place more weight on these attributes during their consideration of prospective teachers.

One-size-fits-all policies aimed at improving overall teacher quality, such as raising teacher salary levels for all teachers, will fail to address the systematic sorting of teachers among schools that exists within districts in Illinois. Rather, policies must be targeted to attract the highest quality teachers in a district or region to the neediest schools.

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Appendices

Table A1. Percent Distribution of TQI Scores by School Type

TQI	All Schools		Elementary/ Middle Schools		High Schools	
	Equal or Higher TQI (%)	Lower TQI (%)	Equal or Higher TQI (%)	Lower TQI (%)	Equal or Higher TQI (%)	Lower TQI (%)
3.0	0.0	100.0	0.0	100.0	-	-
2.7	0.1	99.9	0.1	99.9	-	-
2.6	0.1	99.9	0.1	99.9	0.0	100.0
2.5	0.2	99.8	-	-	0.2	99.8
2.4	0.2	99.8	0.2	99.8	-	-
2.3	0.3	99.7	0.3	99.7	-	-
2.2	0.4	99.6	0.3	99.7	0.5	99.5
2.1	0.5	99.6	0.4	99.6	0.8	99.2
2.0	0.6	99.4	0.5	99.5	1.1	98.9
1.9	0.9	99.1	0.7	99.3	2.0	98.0
1.8	1.3	98.7	0.9	99.1	3.0	97.0
1.7	1.8	98.2	1.3	98.7	4.3	95.7
1.6	2.6	97.4	1.8	98.2	5.0	95.0
1.5	3.0	97.0	2.2	97.8	6.8	93.2
1.4	4.0	96.0	3.0	97.1	8.7	91.3
1.3	5.4	94.6	3.9	96.1	12.6	87.4
1.2	7.2	92.8	5.4	94.6	16.0	84.0
1.1	9.1	90.9	6.9	93.1	20.0	80.0
1.0	11.8	88.2	9.0	91.0	25.5	74.5
0.9	15.0	85.0	11.9	88.1	29.7	70.3
0.8	18.6	81.4	15.1	84.9	35.6	64.4
0.7	23.1	76.9	18.9	81.1	43.6	56.4
0.6	27.0	73.0	22.4	77.6	49.7	50.3
0.5	31.8	68.2	26.9	73.1	55.6	44.4
0.4	36.8	63.2	32.1	67.9	59.8	40.2
0.3	42.2	57.8	37.4	62.6	65.2	34.8
0.2	47.1	52.9	42.5	57.5	69.7	30.3
0.1	52.5	47.5	48.2	51.8	73.4	26.6
0.0	57.9	42.1	53.8	46.2	77.8	22.2
-0.1	62.8	37.2	58.8	41.2	81.8	18.2
-0.2	66.6	33.4	63.1	36.9	83.5	16.5
-0.3	70.3	29.7	67.0	33.0	86.2	13.8
-0.4	74.0	26.0	70.8	29.2	89.4	10.6
-0.5	76.6	23.4	73.7	26.3	91.0	9.0
-0.6	78.8	21.2	76.2	23.8	91.1	8.2
-0.7	80.8	19.2	78.4	21.6	92.5	7.5
-0.8	82.8	17.2	80.5	19.5	93.6	6.4
-0.9	84.6	15.4	82.6	17.4	94.1	5.9
-1.0	86.0	14.0	84.2	15.8	94.6	5.4
-1.1	87.2	12.8	85.5	14.5	95.5	4.5
-1.2	88.6	11.4	87.1	12.9	96.0	4.0
-1.3	89.9	10.1	88.6	11.4	96.1	3.9
-1.4	90.9	9.1	89.7	10.3	96.4	3.6
-1.5	91.6	8.4	90.5	9.5	96.9	3.1
-1.6	92.7	7.3	91.8	8.2	97.0	3.0
-1.7	93.4	6.6	92.6	7.4	97.2	2.8
-1.8	94.2	5.8	93.3	6.7	98.0	2.0
-1.9	94.7	5.3	94.0	6.0	98.4	1.6
-2.0	95.3	4.7	94.6	5.4	98.8	1.2
-2.1	95.8	4.2	95.1	4.9	98.9	1.1
-2.2	96.5	3.5	95.9	4.1	99.4	0.6
-2.3	97.1	2.9	96.6	3.4	99.5	0.5
-2.4	97.4	2.6	96.9	3.1	99.7	0.3
-2.5	97.6	2.4	97.2	2.8	-	-
-2.6	98.1	1.9	97.7	2.3	99.8	0.2
-2.7	98.4	1.6	98.1	1.9	-	-
-2.8	98.6	1.4	98.3	1.7	-	-
-2.9	98.7	1.3	98.5	1.5	-	-
-3.0	99.0	1.0	98.7	1.3	-	-
-3.1	99.2	0.8	99.1	0.9	-	-
-3.2	99.3	0.7	99.2	0.8	-	-
-3.3	99.4	0.6	99.4	0.6	-	-
-3.4	99.5	0.5	99.4	0.6	-	-
-3.5	99.6	0.4	99.5	0.5	-	-
-3.6	99.7	0.3	99.7	0.3	-	-
-3.7	99.7	0.3	99.7	0.3	-	-
-3.8	99.8	0.2	99.8	0.2	-	-
-4.1	99.9	0.1	99.9	0.1	-	-
-4.2	99.9	0.1	99.9	0.1	-	-
-5.0	99.9	0.1	99.9	0.1	-	-
-5.8	99.9	0.1	99.9	0.1	-	-
-6.2	99.9	0.1	-	-	100.0	0.0
-6.7	100.0	0.0	100.0	0.0	-	-

Table A2. Variance Decomposition for Illinois Teacher Quality Attributes: Elementary and Middle Schools

	Variance Decomposition (%) *		
Quality Attribute	**Among Regions**	**Among Districts within Region**	**Among Schools within District**
Teacher Quality Index (TQI)	6.7 (5.1)	40.7 (31.4)	52.6 (63.5)
% of teachers with BA degrees from more-competitive colleges	37.9% (34.5%)	24.8% (32.9%)	37.3% (32.6%)
% of teachers with less than 4 years of teaching experience	10.1% (13.5%)	23.8% (24.4%)	66.1% (62.1%)
% of teachers with emergency or provisional credentials	15.3% (7.5%)	15.3% (18.3%)	69.4% (74.2%)
% of teachers who failed Basic Skills Test on 1st attempt	11.0% (3.1%)	17.7% (13.7%)	71.3% (83.3)%
Average ACT composite score of teachers	0.2 (3.6)	30.3 (20.4)	69.5 (76.0)

*Percentages in parentheses exclude Chicago from the Northeast region.

Table A3. Variance Decomposition for Illinois Teacher Quality Attributes: High Schools

	Variance Decomposition (%) *		
Quality Attribute	**Among Regions**	**Among Districts within Region**	**Among Schools within District**
Teacher Quality Index (TQI)	8.8 (22.5)	17.5 (59.3)	73.7 (18.2)
% of teachers with BA degrees from more-competitive colleges	55.8% (52.4%)	2.6% (36.9%)	41.6% (10.7%)
% of teachers with less than 4 years of teaching experience	4.1% (2.8%)	31.1% (69.8%)	64.8% (27.4%)
% of teachers with emergency or provisional credentials	12.4% (0.1%)	0.0% (81.0%)	87.6% (18.9%)
% of teachers who failed Basic Skills Test on 1st attempt	10.0% (0.0%)	10.4% (75.5%)	79.6% (24.5%)
Average ACT composite score of teachers	7.2 (16.5)	2.7 (64.4)	90.1 (19.1)

*Percentages in parentheses exclude Chicago from the Northeast region.

Table A4. School Quantiles for Illinois Teacher Attributes by Region and Locale

		Illinois				Northeast (less CPS)			CPS	Northwest				East Central				West Central				Southeast		Southwest			
		Urban	Sub.	Town	Rural	Urban	Sub.	Rural	Urban	Urban	Sub.	Town	Rural	Urban	Sub.	Town	Rural	Urban	Sub.	Town	Rural	Town	Rural	Urban	Sub.	Town	Rural
Teacher Quality Index (TQI)	10th	-2.3	-0.8	-0.5	-0.6	-1.3	-0.8	-0.4	-2.6	-0.8	-0.3	-0.4	-0.5	-0.2	-0.3	-0.4	-0.6	-0.3	-0.4	-0.3	-0.6	-0.6	-0.7	-2.2	-1.0	-0.7	-0.8
	50th	-0.7	0.3	0.3	0.2	0.0	0.3	0.4	-1.3	0.3	0.3	0.3	0.4	0.5	0.6	0.5	0.4	0.2	0.5	0.3	0.3	0.0	0.1	-0.6	-0.1	0.2	-0.1
	90th	0.7	1.2	1.0	1.1	0.9	1.2	1.0	0.1	0.9	1.0	1.1	1.1	1.7	1.5	1.1	1.4	0.8	1.2	1.0	1.2	0.7	0.9	0.2	0.5	0.9	0.7
% BA from more-competitive colleges	10th	7.1	6.7	0.0	0.0	6.5	11.1	4.8	13.0	5.9	4.0	3.1	0.0	1.3	3.3	0.0	0.0	4.8	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	50th	22.9	21.4	7.7	9.1	19.0	23.8	16.8	28.0	15.4	13.2	10.5	13.8	14.3	10.3	11.0	11.1	20.3	21.1	10.3	9.1	3.3	0.0	6.9	5.8	5.6	0.0
	90th	44.1	39.4	20.8	25.0	47.3	40.6	32.3	45.2	28.6	22.5	24.2	26.7	56.5	42.1	21.7	26.3	34.8	37.5	26.3	26.7	10.0	11.8	14.8	15.8	13.9	11.8
% with less than 4 years of experience	10th	4.8	7.3	0.0	0.0	8.5	8.8	11.1	5.6	0.0	3.7	4.3	2.8	6.9	5.3	0.0	0.0	5.6	0.0	0.0	0.0	3.7	0.0	0.0	5.1	0.0	0.0
	50th	16.1	18.2	11.1	14.3	20.0	19.5	21.7	16.4	10.0	16.1	13.0	14.3	17.4	14.3	11.2	13.3	15.5	14.7	11.5	12.5	10.0	12.5	6.2	13.3	10.5	13.3
	90th	30.3	34.5	22.2	32.0	35.7	35.3	40.0	30.7	25.0	29.4	23.8	33.3	29.1	31.3	22.3	30.0	28.1	25.0	26.3	29.4	19.0	30.0	20.0	28.1	20.0	31.3
% with emergency or provisional credentials	10th	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	50th	3.2	0.0	0.0	0.0	2.0	0.0	0.0	6.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	90th	15.2	4.3	0.0	0.0	11.7	4.7	2.7	18.2	6.3	1.6	2.3	3.2	0.0	1.1	0.0	0.0	1.3	0.0	0.0	0.0	1.3	0.0	0.0	0.0	0.0	0.0
% who failed Basic Skills Test on 1st attempt	10th	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	50th	6.3	0.0	0.0	0.0	4.4	0.0	0.0	10.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	90th	20.0	8.3	6.7	6.8	15.4	9.5	9.1	22.2	9.1	6.3	8.3	5.9	6.1	6.3	6.7	7.1	8.0	4.8	7.1	5.9	6.7	7.7	20.0	4.0	4.5	0.0
Average ACT composite score of teachers	10th	17.5	19.6	19.4	19.2	19.3	19.6	20.1	17.0	19.0	19.6	19.8	19.3	19.8	19.7	19.4	19.2	19.6	19.7	19.7	19.2	19.1	18.9	16.3	19.3	19.4	19.0
	50th	20.2	21.5	21.3	21.3	21.5	21.6	21.7	19.5	20.9	21.3	21.3	21.6	21.6	21.5	21.7	21.4	20.9	21.2	21.3	21.4	20.8	20.9	19.8	20.9	21.4	21.0
	90th	22.5	23.4	23.0	23.4	22.8	23.5	23.2	22.0	22.5	23.2	23.0	23.4	23.8	24.5	23.4	23.9	22.7	23.5	23.4	23.8	22.5	23.0	22.3	22.5	23.2	23.1

Table A5. School Quantiles for Illinois Teacher Quality Attributes by Region and Percent Minority Students

		Illinois			Northeast (less CPS)			Chicago			Northwest			East Central			West Central			Southeast			Southwest		
		Low	Med.	High	Low	Med.	High	Low	Med.	High	Low	Med.	High	Low	Med.	High	Low	Med.	High	Low	Med.	High	Low	Med.	High
		(Q1)	(Q2-3)	(Q4)	(Q1)	(Q2--3)	(Q4)	(Q1)	(Q2--3)	(Q4)	(Q1)	(Q2--3)	(Q4)	(Q1)	(Q2-3)	(Q4)	(Q1)	(Q2-3)	(Q4)	(Q1)	(Q2-3)	(Q4)	(Q1)	(Q2-3)	(Q4)
Teacher Quality Index (TQI)	10th	-0.6	-0.4	-2.5	-0.2	-0.3	-1.7	-1.8	-2.7	-2.7	-0.4	-0.5	-0.7	-0.4	-0.5	-0.5	-0.6	-0.4	-0.3	-0.8	-0.7	-0.6	-0.8	-0.9	-2.2
	50th	0.3	0.4	-0.9	0.5	0.5	-0.4	-0.4	-1.5	-1.6	0.5	0.4	0.2	0.5	0.4	0.5	0.1	0.4	0.2	0.1	0.1	0.0	0.0	0.0	-0.4
	90th	1.1	1.2	0.3	1.3	1.3	0.5	0.8	-0.2	-0.4	1.3	1.0	0.9	1.4	1.2	1.7	1.0	1.2	1.0	0.9	0.7	0.8	0.7	0.7	0.5
% BA from more-competitive colleges	10th	0.0	3.4	7.8	7.7	12.0	7.5	19.3	14.3	10.0	0.0	0.0	4.5	0.0	0.0	0.0	0.0	0.0	2.7	0.0	0.0	0.0	0.0	0.0	0.0
	50th	8.3	18.2	22.9	21.2	25.0	20.0	35.1	29.7	21.3	14.8	12.5	13.3	10.5	10.8	14.6	9.1	11.4	18.5	4.8	0.0	0.0	4.3	4.8	6.0
	90th	26.1	38.3	41.4	42.1	41.7	33.3	51.4	45.1	37.5	30.0	25.0	25.0	26.3	25.0	55.6	25.0	28.9	33.3	12.5	10.0	9.5	12.5	12.5	16.0
% with less than 4 years of experience	10th	0.0	5.0	6.5	8.7	8.3	10.4	4.8	6.1	5.6	0.0	4.3	0.0	0.0	0.0	5.3	0.0	0.0	4.8	0.0	0.0	4.3	0.0	0.0	5.0
	50th	13.0	16.1	19.2	18.2	18.8	24.6	15.6	17.3	15.8	13.0	15.0	13.0	14.3	12.8	15.9	12.3	12.1	16.0	12.5	10.0	12.2	14.1	11.6	10.0
	90th	30.0	30.9	35.3	35.0	34.3	40.7	26.6	33.3	30.7	31.3	29.4	27.8	30.0	27.7	30.8	29.4	25.7	28.0	36.4	23.7	22.6	31.3	25.0	26.2
% with emergency or provisional credentials	10th	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	50th	0.0	0.0	4.5	0.0	0.0	2.2	3.9	8.2	7.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	90th	0.0	3.0	16.6	2.3	3.8	12.9	11.4	21.4	17.3	2.2	1.6	6.3	0.0	0.0	2.4	0.0	0.0	0.0	0.0	0.0	1.3	0.0	0.0	0.0
% who failed Basic Skills Test on 1st attempt	10th	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	50th	0.0	0.0	8.3	0.0	0.0	5.9	5.3	11.9	12.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	90th	5.9	6.3	21.2	6.3	6.3	18.2	15.1	24.0	23.5	2.5	5.9	9.1	0.0	5.0	8.0	9.1	4.3	7.7	3.8	7.7	5.9	4.8	1.1	16.7
Average ACT composite score of teachers	10th	19.1	19.8	17.3	20.0	20.3	18.4	18.6	17.2	16.6	19.6	19.5	19.3	19.3	19.3	19.6	18.9	19.5	19.9	18.5	19.2	18.9	19.3	19.0	17.5
	50th	21.5	21.5	19.9	21.9	21.8	20.6	20.5	19.2	18.8	21.8	21.4	21.0	21.9	21.4	21.4	21.2	21.4	21.0	21.0	20.9	20.7	21.1	21.1	20.3
	90th	23.4	23.4	22.1	23.6	23.6	22.3	22.5	21.5	21.0	23.7	23.1	22.6	23.9	23.6	23.7	23.4	23.7	22.7	22.7	22.5	23.0	22.9	23.0	22.0

NOTE: Quartiles defined within each Region. Low = low (Quartile 1) percent minority students. High = high (Quartile 4) percent minority students.

Table A6. School Quantiles for Illinois Teacher Attributes by Region and Percent Low-Income Students

		Illinois			Northeast (less CPS)			Chicago			Northwest			East Central			West Central			Southeast			Southwest		
		Low	Med.	High	Low	Med.	High	Low	Med.	High	Low	Med.	High	Low	Med.	High	Low	Med.	High	Low	Med.	High	Low	Med.	High
		(Q1)	(Q2-3)	(Q4)	(Q1)	(Q2-3)	(Q4)	(Q1)	(Q2-3)	(Q4)	(Q1)	(Q2-3)	(Q4)	(Q1)	(Q2-3)	(Q4)	(Q1)	(Q2-3)	(Q4)	(Q1)	(Q2-3)	(Q4)	(Q1)	(Q2-3)	(Q4)
Teacher Quality Index (TQI)	10th	-0.2	-0.6	-2.4	-0.1	-0.3	-1.6	-1.7	-2.7	-2.9	-0.2	-0.4	-0.8	-0.1	-0.5	-0.7	-0.4	-0.6	-0.5	-0.6	-0.7	-0.8	-0.5	-0.8	-2.2
	50th	0.6	0.2	-0.9	0.7	0.4	-0.4	-0.4	-1.5	-1.6	0.6	0.4	0.1	0.8	0.3	0.3	0.5	0.3	0.1	0.1	0.1	0.0	0.2	0.0	-0.6
	90th	1.3	1.1	0.4	1.4	1.2	0.5	0.8	-0.2	-0.5	1.2	1.1	0.8	1.5	1.3	1.4	1.2	1.1	0.8	1.1	0.8	0.7	0.7	0.7	0.2
% BA from more-competitive colleges	10th	7.1	0.0	2.7	12.5	9.8	6.4	18.2	12.5	12.5	3.0	2.8	0.0	3.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	50th	21.4	12.3	20.5	25.7	22.6	19.0	33.3	26.6	25.0	14.3	13.8	12.5	14.3	11.1	10.3	16.1	11.1	12.0	3.3	2.9	0.0	5.9	4.8	4.2
	90th	40.7	32.0	40.0	46.3	39.1	33.3	51.6	42.9	41.2	26.7	27.8	23.8	33.3	30.8	36.4	33.3	27.8	33.3	12.5	11.5	9.5	13.2	14.3	13.0
% with less than 4 years of experience	10th	6.7	3.2	4.8	7.7	8.7	10.5	4.3	5.9	5.9	4.8	0.0	0.0	3.8	0.0	3.7	5.0	0.0	0.0	5.9	0.0	0.0	5.1	0.0	0.0
	50th	17.2	14.3	17.6	17.2	19.4	24.5	14.0	16.2	18.3	15.4	13.3	13.0	15.8	13.5	14.3	14.5	12.0	16.0	12.7	10.5	10.9	14.3	11.1	9.5
	90th	33.3	30.2	34.4	34.4	34.3	40.6	26.9	30.0	34.2	32.0	28.0	31.3	30.0	26.8	32.0	27.3	26.3	28.1	23.7	28.6	25.0	29.4	25.0	26.9
% with emergency or provisional credentials	10th	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	50th	0.0	0.0	4.0	0.0	0.0	2.7	3.3	8.1	8.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	90th	2.5	3.1	16.0	2.4	3.3	12.9	10.3	19.5	19.7	2.0	2.9	5.9	1.1	0.0	0.0	0.0	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0
% who failed Basic Skills Test on 1st attempt	10th	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.4	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	50th	0.0	0.0	7.3	0.0	0.0	5.9	5.2	11.8	12.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	90th	5.9	7.1	20.8	5.9	6.7	18.2	15.9	23.8	23.8	6.3	4.8	9.1	3.7	5.9	9.1	7.1	4.8	7.1	7.7	7.1	5.9	3.7	4.3	16.7
Average ACT composite score of teachers	10th	20.1	19.3	17.4	20.3	20.0	18.4	17.8	17.0	16.8	20.1	19.5	19.0	20.5	19.2	19.1	19.7	19.3	19.4	19.3	19.0	18.0	19.6	19.1	17.5
	50th	21.9	21.3	19.9	22.0	21.8	20.6	20.4	19.1	19.1	22.1	21.5	20.8	22.4	21.4	21.2	22.0	21.3	20.9	21.2	20.9	20.5	21.8	21.0	19.9
	90th	23.7	23.2	22.0	23.8	23.5	22.5	22.6	21.4	20.7	23.5	23.3	22.4	24.5	23.7	23.4	23.9	23.6	22.1	22.7	22.7	22.7	23.2	22.9	22.0

NOTE: Quartiles defined within each Region. Low = low (Quartile 1) percent minority students. High = high (Quartile 4) percent minority students.

For further information, contact the IERC toll-free at 1-866-799-IERC (4372)
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About the Illinois Education Research Council

The Illinois Education Research Council was established in 2000 at Southern Illinois University to provide Illinois with education research to support P-16 education policy making and program development. The IERC undertakes independent research and policy analysis, often in collaboration with other researchers, that informs and strengthens Illinois' commitment to providing a seamless system of educational opportunities for its citizens. Through publications, presentations, participation on committees and an annual research symposium, the IERC brings objective and reliable evidence to the work of state policy makers and practitioners, including the Governor's Office and the Joint Education Committee, a state-level entity composed of the executive officers and designated board members of the Illinois State Board of Education, the Illinois Community College Board, the Illinois Board of Higher Education, and the Illinois Workforce Investment Board.