Illinois Education Research Council
Bringing Research to Policy and Practice
Policy Research Report: IERC 2008-1

Leveling Up: Narrowing the Teacher Academic Capital Gap in Illinois

Bradford R. White, Jennifer B. Presley, and Karen J. DeAngelis

Executive Summary

In 2005, the Illinois Education Research Council (IERC) developed a teacher quality index that used 2002-03 Illinois teacher data to look at how teachers with different academic and experience attributes were distributing among different types of schools in Illinois. We found that high minority, high poverty schools were likely to have a cadre of teachers with lower teacher quality than schools with a more advantaged student body, and that school performance was related to these teacher characteristics, even within types of schools with similar student demographics. This report extends that work by looking at multiple years—from 2001 to 2006—to put the earlier study in the context of change over time.

In this new study, we divided the original teacher quality index into two separate measures—five original teacher components related to teachers' own academic qualifications, and teacher experience. We refer to the revised teacher quality index as the Index of Teacher Academic Capital (ITAC). By keeping academic capital and teacher experience separate, we can better analyze these two distinct components of teacher quality in terms of their distribution across the state and their independent effects on student achievement.

The report contains both good news and bad news for Illinois public schools. The good news is that teacher academic capital in Illinois' most disadvantaged schools improved over the period 2001-2006. The bad news is that there is still a considerable ITAC gap between the state's highest poverty, highest minority schools and the rest of its schools. But the gap has closed by more than 20 percent, with a leveling-up of schools at the bottom of the ITAC scale, without much change for schools at the top. We also show that schools whose ITAC increased saw improved student achievement, and that hiring teachers with stronger academic characteristics can offset the negative impact of lack of teaching experience.

Chicago, especially, has made remarkable progress in bolstering the caliber of its teaching force and serves as a positive example for other large urban districts. The district has shown that not only is it possible to improve teacher quality, but that by hiring new teachers who have stronger academic characteristics, it is possible to do so over a relatively short amount of time.

While many of the findings are encouraging and point the direction to new policies and practices, the state still has a long way to go to eliminate gaps in teacher quality. Students' access to teachers with strong academic backgrounds still depends too much on the location and demographic make-up of their schools. Chicago Public Schools has improved the quality of its teaching staffs, but has yet to catch up with the rest of the state. Moreover, the district will have to work even harder in the future to keep this stronger cadre of new teachers.

MAJOR FINDINGS

1. While schools with high-needs student populations still have lower levels of teacher academic capital, on average, than other schools in the state, Illinois has made improvements in hiring teachers with stronger academic backgrounds. Overall state gains can largely be attributed to improvements that have occurred in Chicago.

Across the state, schools with the highest percentages of low-income and minority students tend to have the lowest levels of teacher academic capital. Between 2001 and 2006, however, these schools made the greatest gains in hiring teachers with stronger academic backgrounds, thereby reducing the gaps in the distribution of teachers with these desirable attributes. The gap between schools with the highest and lowest percentages of low-income students closed by 22 percent, while the gap between schools based on their percentages of minority students closed by 21 percent. This trend represents a "leveling-up effect" across Illinois' schools. In other words, the gains in high-needs schools have not occurred at the expense of other schools.

The improvements in Illinois' high-needs schools are primarily due to positive changes in Chicago, although the district continues to have lower average ITAC scores than the rest of the state. From 2001 to 2006, the gap between Chicago and the highest-ITAC region in the state narrowed by 27 percent. In each of the other six regions, average levels of teacher academic capital remained quite steady over the six-year period. Schools in the East Central region were on top in each year measured, perhaps aided by their proximity to graduates from the University of Illinois at Urbana-Champaign, which has the highest competitiveness ranking among Illinois public institutions.

While teacher academic capital has been improving in the neediest schools, ITAC scores have remained relatively flat elsewhere. As a result, after dropping initially in 2002, the overall state ITAC score increased only slightly each year thereafter to 2006, the most recent year for which data are available.

The small improvements in the overall quality of Illinois teachers' academic backgrounds were due mainly to decreasing proportions of emergency/provisionally certified teachers—most likely because of provisions in the No Child Left Behind Act that strengthened requirements for putting fully certified teachers in classrooms. Improved average ACT composite scores also help explain the higher ITAC outcomes.

Not surprisingly, high schools across the state surpassed elementary/middle schools on all measures of teacher academic capital (except emergency/provisional certification) for all six years. From 2001 through 2006, high schools employed teachers with increasingly stronger academic backgrounds than elementary/middle schools. Meanwhile, elementary/ middle school averages remained relatively flat, causing the gap between the two groups to increase by 4 percent.

2. The improvements in Chicago's teacher academic capital are largely the result of hiring inexperienced teachers with stronger academic backgrounds.

Since the index of teacher academic capital is a school-level measure that cannot be applied to individual teachers, the study isolated two components—ACT composite scores and college competitiveness rankings—to see if inexperienced teachers are bringing with them increased academic capital. Inexperienced teachers are defined as those who have three years or less teaching experience. The study found Chicago's newest teachers are, by and large, driving the district's overall improvement. The district is hiring inexperienced teachers with higher ACT scores and from somewhat more competitive undergraduate institutions. Moreover, this growth in the academic quality of new teachers was far greater in Chicago than in the rest of the state. An earlier IERC study (DeAngelis & Presley, 2007) showed that this change in Chicago had been under way for at least a decade.

The consistent improvement in ITAC is happening at the same time that Chicago is seeing a surge in the number of applicants for teaching positions—going from about 2.5 candidates for each opening in 2002 to 10 candidates for each opening in 2006. As school leaders have had more applicants to choose from, more strongly qualified teachers are being employed in Chicago schools.

One might imagine that Teach for America (TFA) was a major contributor to this changing academic profile of teachers in Chicago. However, TFA did not begin recruiting new teachers to Chicago until 2000, and TFA teachers currently constitute only 4 to 5 percent of the district's inexperienced teachers each year.

3. There is a positive link between the academic backgrounds of teachers and student achievement. Furthermore, on average, schools that show gains in their teacher academic capital also show gains in student achievement.

Based on an examination of schools' scores on state standardized student achievement tests, the study found a positive link between improvements in ITAC and achievement gains. This provides evidence that improving teacher academic capital can boost student achievement, especially in schools with high-needs student populations. In addition, this study found that ITAC gains tend to have a greater positive effect on a school's student achievement than the negative effect associated with teacher inexperience. Therefore, hiring teachers with stronger academic characteristics can offset the negative impact of lack of teaching experience.

It is important to note that the ITAC effects found at the school level in this study do not take into account the impact of individual teachers or improvements in student achievement beyond the proficiency threshold set by the state. However, the results show that even small hikes in teachers' academic capital within schools have ramifications for students' academic performance.

IMPLICATIONS OF THE RESEARCH

Academic capital is just one of many aspects of teacher quality that together with school environments influence student learning in schools. While teacher academic capital is not a silver bullet for improving the academic success of students, it is a meaningful contributor.

The evidence that teacher academic capital is improving in Illinois' neediest schools is significant, and points to some potential strategies for further increasing the quality of the state's teaching force. The findings of this report provide insight that both supports and challenges conventional wisdom on how best to bolster teacher quality:

Inexperienced teachers are not inherently bad for schools. The study raises questions about whether the proportion of inexperienced teachers in a school is the right policy lever on which to focus. The research finds that recent inexperienced teachers are bringing with them stronger academic capital—a factor whose positive effect on student performance tends to counter the negative impact of teacher inexperience. Focusing too narrowly on reducing the proportion of inexperienced teachers in a school might come at the expense of equalizing teacher academic capital across schools.

Raising standards for teacher qualifications pays off. Schools appear to have benefited from the teacher quality provisions of the No Child Left Behind Act of 2001, the introduction in Illinois in 2001 of a more rigorous basic skills test needed for certification, and the 2002 state requirement that all prospective teachers in Illinois pass that enhanced basic skills test before entering preparation programs. These policies have reduced the proportion of emergency-certified teachers in schools in the state and helped school districts and teacher preparation programs be more selective in the individuals they train, certify, and hire to teach in our public schools.

Principals and district human resources officers should take into consideration candidates' academic qualifications, and provide strong supports to keep new, academically-talented teachers in the classroom. As districts experience increases in applications for teaching positions, principals and human resources officers have the ability to be more selective in whom they hire. Unfortunately, in a recent study on teacher attrition in Illinois (DeAngelis & Presley, 2007), the IERC found that teachers with the highest ACT scores and degrees from the most competitive institutions are less likely to remain teaching in the lowest-performing schools. If this trend continues, the improvements in the distribution of Illinois' teacher academic capital in recent years could be eroded. State and district officials need to ensure that all school leaders are implementing effective mentoring and induction support for new teachers, and striving to improve their schools' teaching and learning climates.

Acknowledgements

We would like to thank The Joyce Foundation for funding this research. The opinions and any errors are, of course, those of the authors alone. Kathleen Brown and Jacqueline Twitty of the IERC provided comments and helped edit the report. And, as usual, we thank Jennifer Barnhart for her assistance in the production of this report.

About the Authors

Bradford R. White (brawhit@siue.edu) is Senior Researcher at the Illinois Education Research Council.

Jennifer B. Presley retires from the Illinois Education Research Council, where she was founding Director, effective July 1, 2008. She can be reached at P20 Strategies, LLC (p20strategies@gmail.com).

Karen J. DeAngelis (kdeangelis@warner.rochester.edu) is Assistant Professor in the Margaret Warner Graduate School of Education and Human Development at the University of Rochester.

Suggested citation:
White, B. R., Presley, J. B., & DeAngelis, K. J. (2008). *Leveling up: Narrowing the teacher academic capital gap in Illinois* (IERC 2008-1). Edwardsville, IL: Illinois Education Research Council.

Table of Contents

Introduction

It is now widely accepted in the education policy community that teachers are the most important school-related factor contributing to student achievement. Though identifying foolproof indicators of teacher quality has been elusive and controversial, researchers are beginning to coalesce around a small set of teacher characteristics that, while not determinative, certainly matter in terms of boosting student achievement. These recent studies indicate that the first few years of teaching experience, along with certain measures of teachers' academic abilities, are linked to gains in student learning (Boyd et al., 2007; Rice, 2003; Wayne & Youngs, 2003). Two prior IERC reports (DeAngelis, Presley, & White, 2005; Presley, White, & Gong, 2005) explain how we used existing data on Illinois teachers to measure these quality attributes and how these attributes differ across types of schools in the state. This work has vividly illustrated that Illinois schools with large proportions of poor and minority students have much less access to the attributes associated with teacher quality and, in turn, that these attributes have a measurable impact on student achievement.

In this study, we fine-tune our measure of teacher quality and examine changes in its distribution over time.

In this study, we fine-tune our measure of teacher quality and examine changes in its distribution over time. The analyses presented here track Illinois teacher characteristics and student achievement over six academic years (2000-2001 to 2005-2006), allowing us to examine whether and how Illinois teacher quality has changed. We pay specific attention to whether there are gaps in different types of students' access to teacher quality and whether these gaps are growing or shrinking. We also examine the distribution of experienced and inexperienced teachers in different types of schools across the state. Finally, we investigate the relationship between these teacher characteristics and student achievement and whether increases in teacher quality can improve student performance.

Methodology

Data

We utilize multiple data sources to obtain information on approximately 4,200 Illinois public schools and 125,000 Illinois public school teachers each year from 2001 to 2006.[1] The Illinois Education Research Council has shared data agreements with the Illinois State Board of Education and ACT, Inc. to use these data, and follows strict protocols to protect individually identifiable information.

Teacher Data

The populations of Illinois public school teachers from 2001 through 2006 were drawn from the Teacher Service Record (TSR) database maintained by the Illinois State Board of Education (ISBE). Teachers' basic skills test and baccalaureate

college information were available from the Teacher Certification Information System (TCIS), also maintained by ISBE. Barron's *Profiles of American Colleges* (2003) was used for competitiveness rankings of teachers' baccalaureate colleges, and teachers' ACT scores were provided by ACT, Inc.

School Data

We obtained school-level data for the approximately 4,200 Illinois public schools each year from 2001 through 2006. Student achievement data and teacher emergency/provisional certification rates were available from the Illinois School Report Cards issued by ISBE and published on its website (http://www.isbe.net/research/htmls/report_card.htm). We utilize the Common Core of Data compiled by the National Center for Education Statistics for additional information about Illinois school characteristics, including minority and low-income student concentrations and locale. School poverty levels are reported as the percent of each school's students eligible for the Federal free or reduced-price lunch program (FRL).

The Index of Teacher Academic Capital

In our previous work on the distribution of teacher quality, we developed and utilized a Teacher Quality Index (TQI) which statistically combined six different teacher attributes aggregated to the school level. Reflecting on this previous research and the feedback it received, we decided it was important to fine-tune our measure of teacher quality. Thus, for this study, we use the five components that were found to be most theoretically and statistically similar to create a school-level Index of Teacher Academic Capital (ITAC). (The sixth attribute used in the TQI—teacher experience—is now used as a separate measure.)

The term "academic capital" reflects the education-based characteristics of teachers that are available to be utilized by the school as an organization.

We use the term "academic capital" to reflect the education-based characteristics of teachers that research indicates are linked to student achievement. We refer to these characteristics as "capital" because they represent a collection of intellectual resources and assets that are available to be utilized by the school as an organization. The ITAC includes the following five school-level teacher attributes (see DeAngelis, Presley, & White, 2005, for specific details):

1. The mean ACT composite score of teachers at the school;
2. The mean ACT English score of teachers at the school;
3. The percentage of teachers at the school who failed the Illinois Basic Skills test on their first attempt;[2]
4. The percentage of teachers at the school who were emergency/provisionally certified; and

5. The mean Barron's competitiveness ranking of the undergraduate institutions attended by the school's teachers (Barron's, 2003). (Note: Barron's rankings are expressed on a six point scale from 1=non-competitive to 6=most competitive.)

We calculate an ITAC score for each school each year by using principal components analysis to statistically combine these five components. In order to measure change in ITAC over time, we produced a measure that was comparable from year to year, but also based on an observed distribution of teacher attributes. We did this by using 2003 as a "base year" to establish an actual relationship between ITAC components at a set point in time, and then applied these constant, derived weights to the components for each year.[3] The component weights derived from this analysis are shown in Table 1. We chose 2003 as our base year to retain continuity with our initial study, so that the 2003 ITAC mean (0.0) and standard deviation (1.0) remained the same. Thus, each school's ITAC score reflects its standing relative to the average school during the base year of 2003, so if a particular school had an ITAC of 1.0 in 2006, this would mean that its teacher academic capital that year was one standard deviation higher than the average Illinois school in 2003.

Table 1. ITAC Components and Weights

ITAC Component	Weight
Teachers' Mean ACT Composite Score	0.91
Teachers' Mean ACT English Score	0.90
% of Teachers Failing the Basic Skills Test on Their First Attempt	-0.36
% of Teachers with Emergency/Provisional Certification	-0.50
Teachers' Mean Undergraduate College Competitiveness Ranking	0.45

Teacher Experience

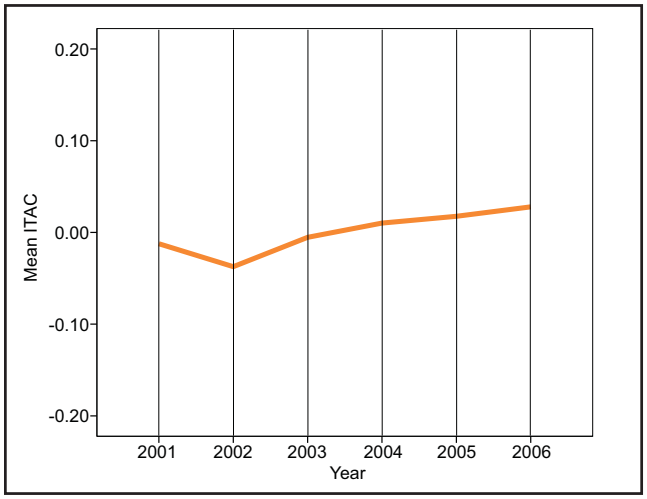
Research indicates that teachers become more effective during their initial teaching years, but that the benefits of experience tend to level off soon thereafter (Boyd et al., 2007; Rice, 2003). For this reason, we define a school's proportion of "inexperienced teachers" as the percentage of its teachers with three or fewer years of teaching experience. Our prior work on teacher quality indicated that this experience measure did not contribute significantly to our index and, for this reason, we treat teacher experience as a variable separate from ITAC in this study. Excluding this component from the ITAC and examining it alongside this index actually serves to underscore, and not diminish, the role of teacher experience, since it contributed only marginally to our previous composite.

Changes in Illinois Teacher Academic Capital, 2001 – 2006

ITAC values in Illinois from 2001 to 2006 show slight improvement overall. While the average level of teacher academic capital in Illinois decreased from 2001 to 2002, it has increased steadily since then (see Figure 1). Overall though, these annual changes were quite small, with yearly ITAC averages hovering between -0.04 and 0.03, or less than 5 percent of a standard deviation above and below the baseline mean of 0.00 in 2003.

ITAC values in Illinois from 2001 to 2006 show slight improvement overall.

Figure 1. Statewide Mean School ITAC, by Year



Since ITAC averages may mask changes that are occurring at different points in the range, we also examine points along the full distribution. Table 2 shows that the ITAC scores for schools at the bottom tenth percentile improved steadily after 2002 through 2006 (from -1.38 up to -1.13), while the ITACs of schools at the middle and high ends of the distribution (the 25th, 50th and 75th percentiles) remained quite stable. During this time, the standard deviation of the ITAC (a measure of the gaps among schools) also decreased after 2002. Thus the improvement from 2001 to 2006 was primarily the result of increases in the lowest-ITAC schools, narrowing the gap between the lowest-ITAC schools and other schools.

The improvement from 2001 to 2006 was primarily the result of increases in the lowest-ITAC schools, narrowing the gap between the lowest-ITAC schools and other schools.

Table 2. ITAC Scores at Selected Percentiles Each Year

ITAC Percentile	2001	2002	2003	2004	2005	2006	Change
10th	-1.38	-1.41	-1.27	-1.19	-1.14	-1.13	+0.25
25th	-0.53	-0.54	-.051	-0.49	-0.50	-0.47	+0.06
50th	0.09	0.09	0.10	0.09	0.09	0.10	+0.01
75th	0.65	0.63	0.64	0.63	0.62	0.63	-0.02
Standard Deviation	1.0	1.1	1.0	1.0	0.9	0.9	-0.10

Since ITAC consists of five components, we examined whether each or only some of these components improved between 2001 and 2006. Table 3 shows that, for the state as a whole, improvements in ITAC were due primarily to decreasing proportions of emergency/provisionally certified teachers (5.1% down to 4.5%—possibly related to the Highly Qualified Teacher provisions of No Child Left Behind) and improved teacher ACT composite scores (the average for teachers across the state increased from 20.98 to 21.16). The proportion of teachers failing the state's basic skills test is the only ITAC component that did not improve over the period of our study—increasing from 0.27 percent in 2001 to 0.51 percent in 2006—though the total first-attempt failure rates remained quite low overall (see the shaded box "The Illinois Basic Skills Test" below for more information).[4]

Table 3. ITAC Component Averages, by Year

ITAC Component	2001	2002	2003	2004	2005	2006	Change
% Emergency/Provisional Certification	5.12%	5.33%	5.26%	4.79%	4.77%	4.50%	-0.62
% Failed Basic Skills Test	0.27%	0.44%	0.42%	0.44%	0.44%	0.51%	+0.24
Mean ACT Composite	20.98	20.99	21.06	21.10	21.13	21.16	+0.18
Mean ACT English	21.59	21.54	21.59	21.59	21.59	21.58	-0.01
Mean College Competitiveness	3.04	3.03	3.04	3.03	3.03	3.04	0.0

Summary: Changes in ITAC, 2001 – 2006

The ITAC "floor" was raised without lowering the ITAC "ceiling."

In the first section of this report, we show that average ITAC in the state decreased slightly from 2001 to 2002, then increased (also slightly) from 2002 to 2006. These improvements were primarily the result of gains among the lowest-ITAC schools, which resulted in a narrowing of the ITAC gap between the lowest- and highest-scoring schools. That is, the ITAC "floor" was raised without lowering the ITAC "ceiling."

The Illinois Basic Skills Test

The Illinois Basic Skills Test was introduced in 1988. The initial version of this test was pitched at approximately the ninth grade level, and teachers were required to pass the test in order to become certified. In September 2001, the "enhanced" basic skills test, which was geared towards a college level education, replaced the initial test as a prerequisite for certification. In July 2002, the Illinois state legislature required that all prospective teachers pass the enhanced basic skills test prior to admission into a teacher education program. Thus, we have four different groups of teachers in Illinois:

- teachers certified prior to 1988 who were never required to take a basic skills test (approximately 39% of the teachers in our study population);
- teachers certified between 1988 and September 2001 who were required to pass the initial version of the basic skills test prior to endorsement (about 54% of our teachers);
- teachers who were required to pass the enhanced basic skills test prior to certification between September 2001 and July 2002 (about 3%);
- and teachers who were required to pass the enhanced basic skills test prior to admission into teacher education programs after July 2002 (about 4%).

Since scores on the two tests are not comparable and there was a relatively small proportion (7%) of individuals teaching by 2006 who took the enhanced basic skills test (after September 2001), we opted to use as our school-level basic skills test measure the percentage of each schools' teachers who failed the initial basic skills test (prior to the introduction of the enhanced test in September 2001) as a proportion of all those attempting that test.

Examining the ITAC Gap

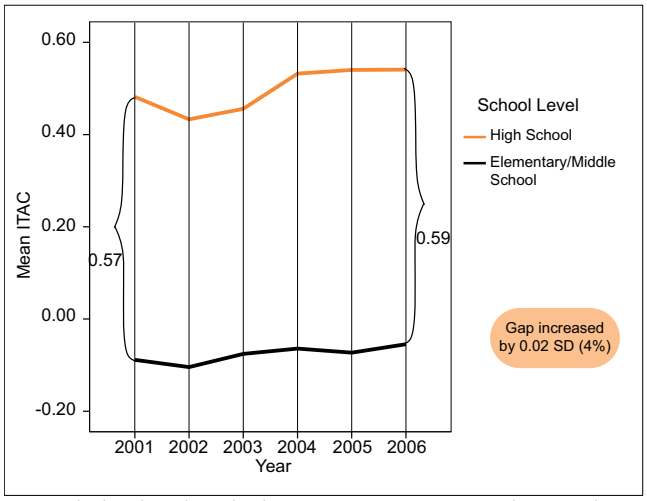
The small positive overall change in Illinois teacher academic capital from 2001 to 2006 masks some considerable disparities among different types of schools. In this section, we examine differences in ITAC and its five components across three different school dimensions: school level (high schools compared to elementary/middle schools), student demographics (school percent minority and low income), and school geography (region and locale). In each of these comparisons, it is important to consider not just whether school ITAC scores are improving over time, but also whether Illinois has been making any progress in closing the "ITAC gap" between the highest and lowest school categories.

ITAC Differences by School Level

Elementary/ middle school ITAC averages remained relatively flat throughout the study, while high school ITAC averages increased from 2002 through 2006.

From 2001 through 2006, high schools consistently had much higher average ITAC scores than elementary/middle schools (Figure 2). The annual school-level ITAC gap is much larger than the overall changes in ITAC from year-to-year—consider that this gap was roughly one half of a standard deviation, while the annual changes in overall ITAC were only a few hundredths of a standard deviation, or less than one-tenth the size of the school-level gap.

Figure 2. Average Annual ITAC, by School Level



Note: The brackets show the difference in average ITAC between the two groups.

Elementary/middle school ITAC averages remained relatively flat throughout the study, while high school ITAC averages increased from 2002 through 2006. We emphasize again that these within-level changes were quite small in comparison to the large ITAC gap between school levels. Table 4 shows the differences between school levels for each ITAC component over the six-year period. High schools surpassed elementary/middle schools on all measures except emergency /provisional certification for all six years. Despite having higher emergency certification rates, high school teachers had consistently lower failure rates on the basic skills test, and higher ACT composite and English scores and college competitiveness rankings.

Table 4. ITAC Component Averages, by School Level

ITAC Component	School Level	2001	2002	2003	2004	2005	2006	Change
% Emergency/Provisional Certification	Elementary/Middle	4.64%	4.85%	4.73%	4.26%	4.37%	3.94%	-0.70
	High School	6.21%	6.73%	6.80%	5.76%	5.95%	5.64%	-0.57
% Failed Basic Skills Test	Elementary/Middle	0.27%	0.39%	0.35%	0.39%	0.40%	0.46%	+0.19
	High School	0.14%	0.23%	0.33%	0.18%	0.17%	0.23%	+0.09
Mean ACT composite	Elementary/Middle	20.74	20.76	20.83	20.87	20.87	20.90	+0.16
	High School	22.30	22.23	22.29	22.40	22.44	22.47	+0.17
Mean ACT English	Elementary/Middle	21.48	21.44	21.47	21.47	21.44	21.45	-0.03
	High School	22.33	22.24	22.32	22.39	22.43	22.39	+0.06
Mean College Competitiveness	Elementary/Middle	3.02	3.01	3.02	3.01	3.01	3.02	0.00
	High School	3.16	3.16	3.17	3.18	3.17	3.17	+0.01

ITAC Differences by Geographic Region and Locale

The ITAC gaps by region and locale are largely driven by differences between Chicago—which we consider as a separate region and a separate locale—and the rest of the state (Figures 3 and 4). On average, ITAC scores for schools in Chicago are roughly one standard deviation lower than for schools in other regions and locales in the state. However, the gap shrank considerably over the period 2001-2006.

ITAC scores for schools in Chicago are roughly one standard deviation lower than for schools in other regions and locales in the state.

Figure 3. Average Annual ITAC, by Region

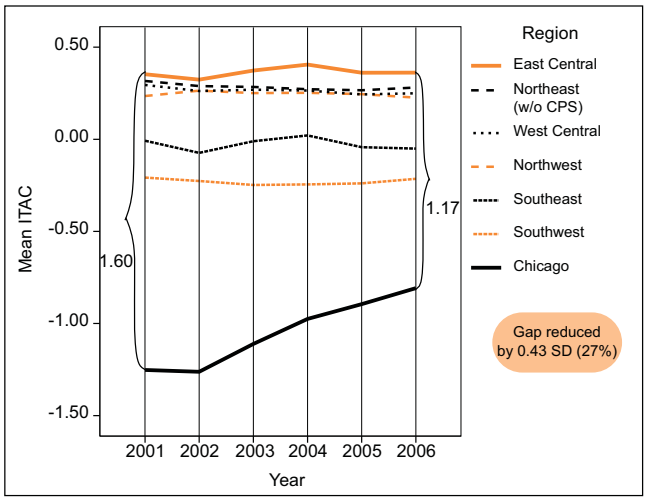
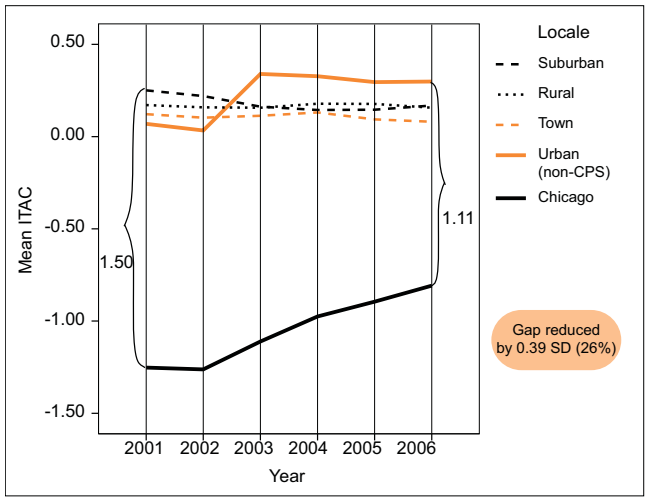


Figure 4. Average Annual ITAC, by Locale



Note: The brackets show the difference in average ITAC between the lowest group and the highest group.

ITAC Differences by Region

The ITAC gap between Chicago and the highest-scoring region diminished by 27% from 2001 to 2006.

Schools in Chicago consistently had much lower ITACs than other regions in Illinois. Other than Chicago, schools in the two southern regions of Illinois exhibited consistently lower ITACs, on average, than the rest of the state, while schools in the East Central region were on top in every year measured. East Central region schools' ITAC scores were likely boosted by their proximity to graduates from the University of Illinois at Urbana-Champaign, which has the highest competitiveness ranking (5 on a 6-point scale) among Illinois public institutions. The ITAC gap between Chicago and the East Central region diminished by 27 percent over the period of our study, shrinking from 1.60 standard deviations in 2001 to 1.17 standard deviations in 2006. Schools in the Northeast (outside of Chicago), Northwest, and West Central regions were generally more similar to East Central schools than to their southern Illinois counterparts. In each of those regions, average school ITACs remained steady over the six-year period.

ITAC Differences by Locale

The gap between Chicago and the highest-scoring locale reduced by 26% over six years.

Again, Chicago schools had the lowest ITAC scores of any locale in each year of our study. However, the gap between Chicago and the highest scoring locale in 2001 (suburban schools) was 1.50 standard deviations, while the gap between Chicago and the highest scoring locale in 2006 (urban non-Chicago schools) was only 1.11 standard deviations, an ITAC gap reduction of 26 percent over six years. There were also some interesting changes to ITAC in urban (non-Chicago) schools. In 2001, urban (non-Chicago) schools ranked just below suburban, rural, and town schools (in that order) in terms of average school ITAC. But in 2003, urban (non-Chicago) schools ascended atop the ITAC locale rankings, and have remained there since. (It is important to remember that urban areas are defined here by their population

In 2003, urban (non-Chicago) schools ascended atop the ITAC locale rankings, and have remained there since.

size rather than student demographics, so the typical depiction of "inner city schools" does not apply to all Illinois schools that are considered "urban" nor are all "suburban" schools low minority and low poverty.) The large one-year ITAC growth in urban (non-Chicago) schools between 2002 and 2003 saw average ACT composite and English scores in those schools increase by about 0.6 points each, more than double the increase in any other locale (data not shown).

ITAC in Chicago

The largest improvements in average school ITAC from 2001 to 2006 occurred among Chicago schools, where the average ITAC increased from a low of -1.26 in 2002 to a high of -0.81 in 2006. The improvement in Chicago schools' ITAC scores extended across all five components except the schools' average percentage of teachers failing the basic skills test, though this component increased slightly in Chicago (Table 5) while increasing by larger proportions in most other regions and locales across the state (not shown). Nevertheless, Chicago schools' average proportions of teachers with emergency/provisional certification remains much higher than the statewide average of about 5 percent (see Table 3). From 2001 to 2006, Chicago schools' average percentages of emergency/provisionally certified teachers fell from 22 percent to 16 percent. While again closing, the gap between Chicago and the state as a whole continues for other components of schools' ITACs.

At 16 percent in 2006, Chicago schools' average proportions of teachers with emergency/ provisional certification remains much higher than the statewide average of about 5%.

Table 5. Chicago Schools' ITAC and Component Averages, 2001-2006

ITAC Component	2001	2002	2003	2004	2005	2006	Change
ITAC	-1.25	-1.26	-1.11	-0.98	-0.90	-0.81	+0.44
% Emergency/ Provisional Certification	22.03%	22.52%	21.45%	18.96%	18.49%	16.37%	-5.66
% Failed Basic Skills Test	0.66%	1.00%	0.79%	0.84%	0.78%	0.80%	+0.14
Mean ACT Composite	19.11	19.18	19.44	19.69	19.85	19.92	+0.81
Mean ACT English	19.57	19.62	19.87	20.04	20.17	20.23	+0.66
Mean College Competitiveness	2.94	2.93	2.95	2.94	2.95	2.98	+0.04

ITAC Differences by Schools' Student Demographics

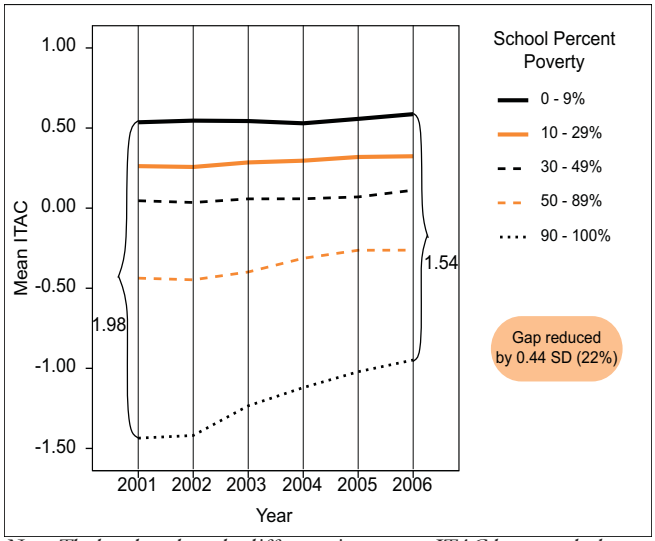
The previous section illustrated that increases in schools' teacher academic capital between 2001 and 2006 were largely due to improvements in Chicago schools and, to a lesser extent, schools in other urban locales. In this section, we examine schools' ITAC differences based on their student demographic compositions. We then put together these two pieces of the analysis and explore school geography (region and locale) by school demographics in the section that follows.

School Percent Poverty

Figure 5 shows that there are large ITAC differences by student poverty category, but this gap narrowed between 2001 and 2006. ITAC is closely linked to school poverty levels, with the largest ITAC gap occurring between schools with 50 to 89 percent free or reduced-price lunch (FRL) students and schools where 90 to 100 percent of students are eligible for free or reduced-price lunches. While the ITAC gap between the highest and lowest poverty categories was 1.98 standard deviations in 2001, it decreased by 22 percent (to 1.54 standard deviations) over six years to 2006. ITAC scores for the second highest poverty group also improved. ITACs for schools with less than 50 percent poverty changed very little over the period of our study.

There are large ITAC differences by student poverty category, but this gap narrowed by 22% from 2001 to 2006.

Figure 5. Average Annual ITAC, by Poverty Category



Note: The brackets show the difference in average ITAC between the lowest group and the highest group.

The average ITAC score for highest poverty (90-100% FRL) schools improved from -1.44 in 2001 to -0.95 in 2006 (Table 6). Looking at the ITAC components over the same time period, we see that the average emergency/provisional certification rate in high poverty schools decreased from 22 percent to 14 percent, the average ACT composite score increased from 18.77 to 19.60, the average ACT English

Table 6. Highest Poverty (90-100% FRL) Schools' ITAC and Component Averages, 2001-2006

ITAC Component	2001	2002	2003	2004	2005	2006	Change
ITAC	-1.44	-1.42	-1.23	-1.12	-1.02	-0.95	+0.49
% Emergency/ Provisional Certification	21.93%	21.01%	20.41%	17.75%	16.40%	14.45%	-7.48
% Failed Basic Skills Test	0.83%	1.06%	0.88%	0.97%	1.15%	0.96%	+0.13
Mean ACT Composite	18.77	18.83	19.22	19.37	19.53	19.60	+0.83
Mean ACT English	19.22	19.29	19.62	19.74	19.92	19.92	+0.70
Mean College Competitiveness	2.88	2.85	2.87	2.88	2.90	2.91	+0.03

score increased from 19.22 to 19.92, and the average college competitiveness ranking increased slightly from 2.88 to 2.91.

School Percent Minority

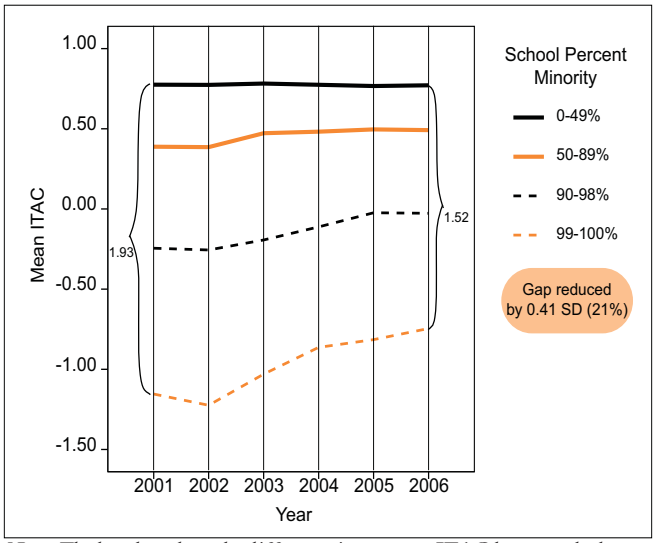
We see a similar distribution and trend pattern when we look at ITAC scores by school minority levels (Figure 6). Schools with 99 to 100 percent minority students have much lower ITAC averages than other schools, although this gap has been closing in recent years. The ITAC gap between the highest minority category (99-100% minority) and the lowest minority category (0-49% minority) narrowed by 21 percent over the period of our study (shrinking from 1.93 to 1.52 standard deviations).

On average, schools with 99 to 100% minority students have much lower ITACs than other schools, although this gap narrowed by 21% from 2001 to 2006.

There is also a substantial ITAC gap between schools with 90 to 98 percent minority students and those with 50 to 89 percent minority populations. As with the analysis by student poverty levels, we again see that the ITAC gap between the highest and second highest minority categories closed substantially (from 0.63 to 0.53 standard deviations, a 16% reduction), even as schools in the second highest minority category improved their ITAC scores. Schools with minority concentrations of less than 90 percent had ITAC scores consistently above the state average (0.0), but such schools experienced little or no ITAC improvement, on average, from 2001 to 2006.

Schools with minority concentrations of less than 90% had ITAC scores consistently above the state average (0.0), but such schools experienced little or no ITAC improvement, on average, from 2001 to 2006.

Figure 6. Average Annual ITAC, by Minority Category



Note: The brackets show the difference in average ITAC between the lowest group and the highest group.

The average ITAC score for highest minority (99-100%) schools increased from -1.65 in 2001 to -1.25 in 2006. These schools' average college competitiveness ranking stayed relatively stable from 2001 to 2006. During the six-year period, highest minority schools' average percentage of emergency/provisionally certified teachers fell from 25 percent to 18 percent, their average ACT composite scores rose from 18.47 to 19.15, and their average ACT English scores increased from 18.87 to 19.41 (Table 7).

Table 7. Highest Minority (99-100% Minority) Schools' ITAC and Component Averages, 2001-2006

ITAC Component	2001	2002	2003	2004	2005	2006	Change
ITAC	-1.65	-1.72	-1.53	-1.36	-1.31	-1.25	+0.40
% Emergency/Provisional Certification	25.46%	25.84%	24.05%	21.40%	20.78%	18.28%	-7.18
% Failed Basic Skills Test	0.97%	1.47%	1.39%	1.06%	1.07%	1.11%	+0.14
Mean ACT Composite	18.47	18.44	18.78	19.01	19.09	19.15	+0.68
Mean ACT English	18.87	18.81	19.15	19.36	19.40	19.41	+0.54
Mean College Competitiveness	2.88	2.85	2.87	2.87	2.88	2.90	+0.02

ITAC Differences by Geography and Demographics

At each poverty and minority level, ITACs in Chicago schools are lower on average than ITACs in similar non-Chicago schools. However, the gaps are closing at each student demographic level.

In the previous sections, we showed that schools with high proportions of low income or minority students typically have ITAC scores below the state average, and this gap widens substantially as the proportion of poor or minority students increases. However, the ITAC gap has been closing since 2002, especially for the highest poverty, highest minority schools. In this section we combine school geography and student demographic data to examine whether these changes are occurring across the state or if they are simply the result of improvements in Chicago.

The uneven distribution of teacher academic capital is not a "Chicago-only" issue. In fact, ITAC actually dropped slightly in high-minority (90%+) non-Chicago schools between 2001 and 2006.

When we combine school geographic and demographic data, we see that there are still gaps between Chicago and the rest of Illinois (Tables 8 and 9). That is, at each poverty and minority level, ITACs in Chicago schools are lower on average than ITACs in similar non-Chicago schools. However, the gaps are closing at each student demographic level. The results also show that schools with high concentrations of poor and/or minority students have low ITAC scores regardless of their location—that is, the uneven distribution of teacher academic capital is not a "Chicago-only" issue. These tables also show that ITAC is improving rapidly across all groups of Chicago schools, but, outside Chicago, only in high poverty schools. In fact, ITAC actually dropped slightly in high-minority (90%+) non-Chicago schools between 2001 and 2006.

Table 8. Average ITAC by Poverty Category, Chicago/Non-Chicago (2001 and 2006)

	Non-Chicago			Chicago		
Poverty Category	2001	2006	Change	2001	2006	Change
0 - 9% FRL	0.54	0.59	+0.05	N=3	N=3	—
10 - 29% FRL	0.27	0.33	+0.06	-0.34	-0.23	+0.11
30 - 49% FRL	0.06	0.12	+0.06	-0.29	-0.11	+0.18
50 - 89% FRL	-0.21	-0.17	+0.04	-1.02	-0.72	+0.30
90 - 100% FRL	-1.00	-0.77	+0.23	-1.52	-0.99	+0.53

Table 9. Average ITAC by Minority Category, Chicago/Non-Chicago (2001 and 2006)

	Non-Chicago			Chicago		
Minority Category	2001	2006	Change	2001	2006	Change
0 - 49% Minority	0.28	0.28	0.00	-0.54	-0.47	+0.07
50 - 89% Minority	-0.01	0.05	+0.06	-0.44	-0.24	+0.20
90 - 98% Minority	-0.41	-0.46	-0.05	-1.06	-0.60	+0.46
99 - 100% Minority	-1.25	-1.34	-0.09	-1.75	-1.22	+0.53

Summary: Examining the ITAC Gap

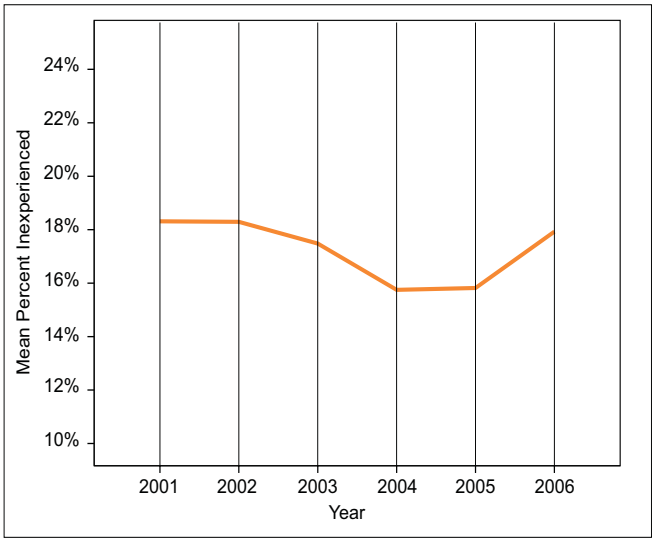
There continue to be considerable ITAC disparities among different types of schools in Illinois. There are quite large differences in ITAC between high schools and elementary/middle schools, with high schools consistently having higher ITAC scores. There are ITAC gaps by region and locale that are largely driven by the differences between Chicago and the rest of the state. We also find evidence of large ITAC differences based on schools' student demographic compositions, with high-poverty and high-minority schools consistently presenting lower ITAC scores. When we combine school geography and student demographics, we see that there is still a gap between Chicago and the rest of Illinois. However, these gaps shrank considerably from 2001 to 2006, with Chicago making great strides in improving teacher academic capital in its schools.

ITAC gaps shrank considerably from 2001 to 2006, with Chicago making great strides in improving teacher academic capital in its schools.

The Distribution of Inexperienced Teachers

Illinois schools' annual average percentages of inexperienced teachers (those with three or fewer years of experience) varied only slightly over the period of this study, ranging from around 18 percent in 2001, 2002, and 2006 to about 15.5 percent in 2004 and 2005 (Figure 7). But, because of the relationship between teacher effectiveness and experience, policy makers are particularly concerned about whether schools with higher proportions of poor or minority students—many of which are low-performing schools—are getting an "unfair" proportion of new teachers.

Figure 7. Average School Percentage of Inexperienced Teachers, by Year



Schools' proportions of inexperienced teachers are modestly related to their concentrations of poor and minority students, but the differences are not as stark as might be expected.

Figures 8 and 9 show that schools' proportions of inexperienced teachers are modestly related to their concentrations of poor and minority students, but the differences are not as stark as might be expected. That said, however, the lowest minority schools (0-49%) consistently have the lowest proportion of inexperienced teachers. But these two figures also show quite similar six-year trends across all school types, with declines from 2001 to 2004 or 2005 and then growth in 2006 in schools' proportions of inexperienced teachers.

Figure 8. Average Annual School Percentage of Inexperienced Teachers, by School Poverty Category

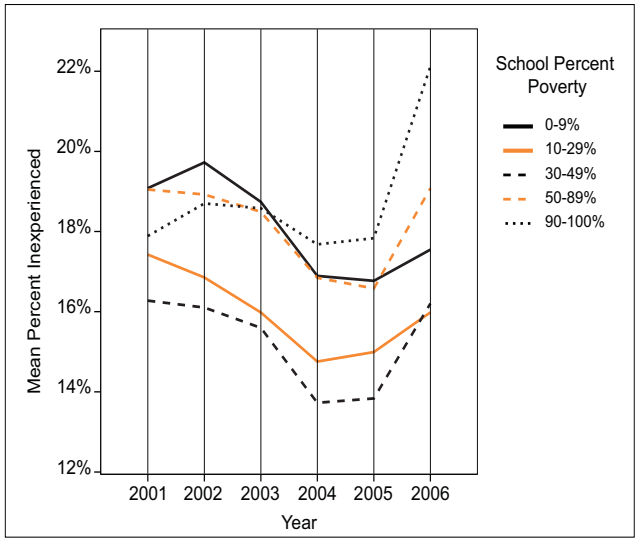
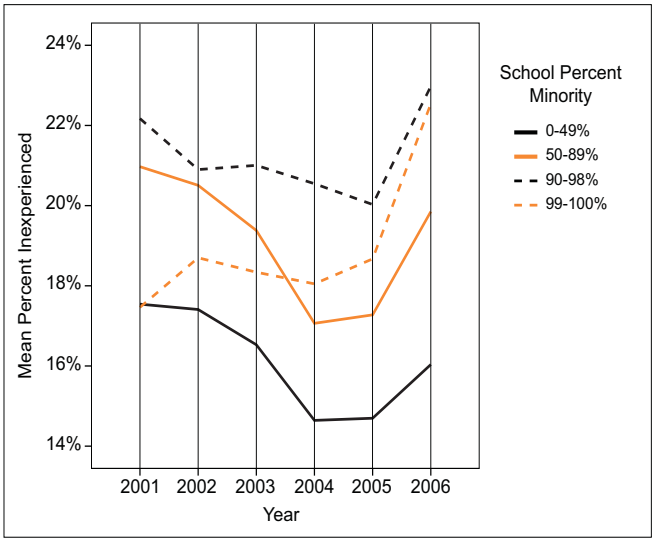


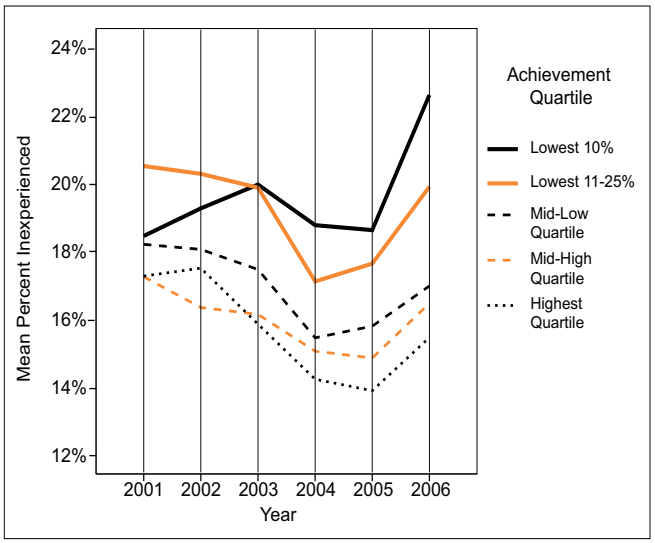
Figure 9. Average Annual School Percentage of Inexperienced Teachers, by School Minority Category



We also explored schools' proportions of inexperienced teachers by school achievement levels (Figure 10). This analysis revealed that school concentrations of inexperienced teachers appear to be more systematically linked to achievement than school demographics. The lowest achieving quartile of schools consistently had the highest proportions of inexperienced teachers, while the highest achieving quartiles had the smallest proportions of inexperienced teachers, and this gap widened in 2006. These findings align with our earlier study of teacher attrition (DeAngelis & Presley, 2007) which showed that new teachers, and especially high academic capital new teachers, were more likely to leave schools with low student achievement than they were to leave schools with high concentrations of poor or

School concentrations of inexperienced teachers appear to be more systematically linked to achievement than school demographics.

Figure 10. Average Annual School Percentage of Inexperienced Teachers, by Achievement Quartile

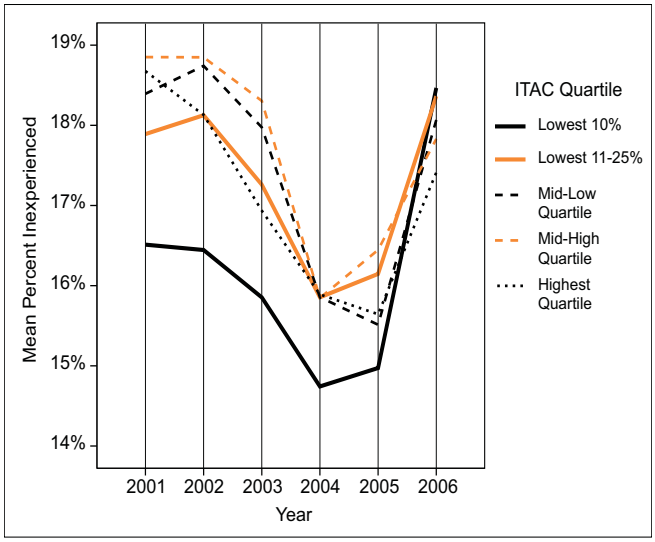


minority students. The higher teacher exit rates in these lowest performing schools contribute to higher proportions of inexperienced teachers in such schools.

ITAC, as a school resource, has little relationship to the proportions of inexperienced teachers in schools.

Finally, we examine the distribution of inexperienced teachers by school ITAC quartile (Figure 11).[5] In general, schools with higher ITACs had higher proportions of inexperienced teachers early in the period of study, although the differences are only 3.5 percentage points or less. Again, we see that the overall trends are very similar across all ITAC categories. Schools falling into the lowest 10 percent of schools on the basis of their ITACs had the *lowest* proportions of inexperienced teachers until 2006, when the proportions among all categories of schools were within one percentage point—around 18 percent inexperienced teachers. It appears that ITAC, as a school resource, has little relationship to the proportions of inexperienced teachers in schools.

Figure 11. Average Annual School Percentage of Inexperienced Teachers, by School ITAC Category



Summary: Inexperienced Teachers

The term "high-needs schools" with regard to teacher inexperience should be based upon student performance rather than student demographics.

We found that the relationship between schools' concentrations of inexperienced teachers and their proportions of poor and minority students is less systematic than a simple diagnosis would predict, and that the lowest-ITAC schools generally have had the lowest proportions of inexperienced teachers, although differences are disappearing. However, we did find that inexperienced teachers are unevenly distributed when we view schools by achievement levels, with the lowest achieving schools tending to have the largest proportions of inexperienced teachers. Taken together, these data suggest that the term "high-needs schools" with regard to teacher inexperience should be based upon student performance rather than student demographics.

In-Depth: A Closer Look at Inexperienced and New Teachers

What is causing the ITAC gaps to close in Illinois? Since ITAC is a composite of characteristics of teachers in schools, we know that ITACs change when schools gain and lose teachers from year to year. So, one explanation for the ITAC gains might be that new teachers are driving improvement. To examine this hypothesis, we investigate trends for experienced and inexperienced teachers in Chicago and non-Chicago schools then take an in-depth look at new teachers in Chicago, where the largest improvements to ITAC occurred between 2001 and 2006. The analyses in this section utilize "teacher level" data, as opposed to the "school level" data employed in the rest of this report. Since ITAC is an aggregate index that measures teachers' academic capital as a school resource, it is not calculated for individual teachers. In order to gain some understanding of individual teachers' academic capital characteristics, we chose to focus on two of the ITAC components—ACT composite scores and undergraduate college competitiveness. We compare these academic capital characteristics of inexperienced teachers directly to those of teachers with more experience.

Chicago is hiring new teachers with higher ACT scores and from somewhat more competitive undergraduate institutions.

As seen in Figure A, inexperienced teachers (defined as those with three years or less teaching experience) in Chicago have consistently higher ACT composite averages than experienced teachers in that district, and the gap between the two groups is growing. This trend holds for college competitiveness as well (Figure B—remember that competitiveness rankings range from 1=non-competitive to 6=most competitive). Chicago is hiring new teachers with higher ACT scores and from somewhat more competitive undergraduate institutions.

Figure A. Mean Annual Teacher ACT Composite, by Experience Level for Chicago and Non-Chicago

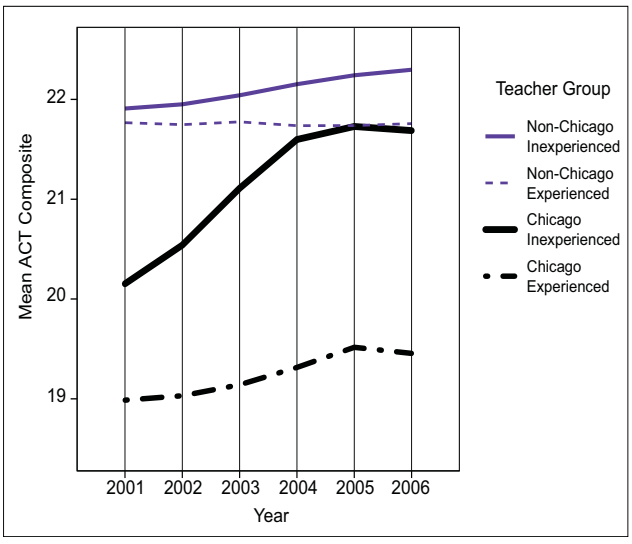
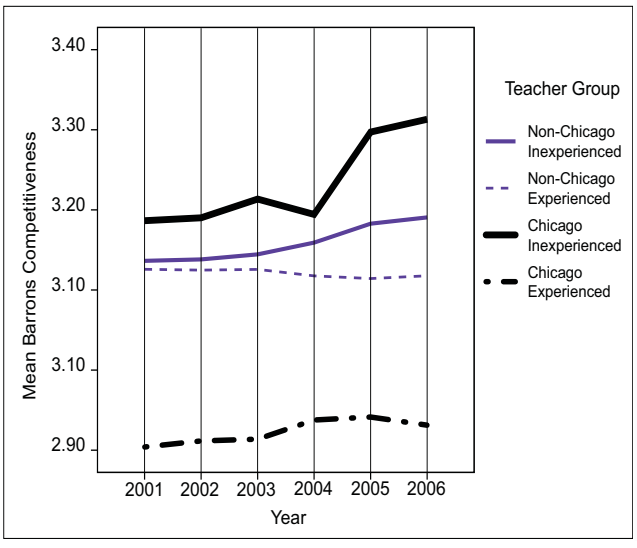


Figure B. Mean Annual Teacher College Competitiveness, by Experience Level for Chicago and Non-Chicago



In recent years, ACT composite averages for inexperienced teachers in Chicago have rivaled those of experienced teachers in the rest of the state, though they are still not quite as high as inexperienced teachers elsewhere in the state.

Figures A and B also illustrate that improvements in inexperienced teachers' academic capital were greater in Chicago than in the rest of the state. In recent years, ACT composite averages for inexperienced teachers in Chicago have rivaled those of experienced teachers in the rest of the state, though they are still not quite as high as inexperienced teachers elsewhere in the state. Since at least 2001, inexperienced teachers in Chicago have consistently graduated from somewhat more selective undergraduate institutions, on average, than both experienced Chicago teachers and all teachers elsewhere in the state. Our prior work (DeAngelis & Presley, 2007) shows that these changes in Chicago have been underway for at least a decade. However, the influx of academically stronger teachers in Chicago has yet to translate to much improvement in the academic capital of the cadre of experienced teachers.

New Teachers in Chicago

Now we delve further into Chicago schools and focus solely on brand new teachers, those with no prior teaching experience. We use data from two new-teacher cohorts—2001 and 2006—to help us understand whether the initial hiring of new teachers contributes to the unequal distribution of teacher qualifications across schools that we have shown here and in earlier reports (DeAngelis, Presley, & White, 2005; Presley, White, & Gong, 2005). Again, we use teachers' ACT composite scores and college competitiveness rankings for this teacher-level analysis.

The Distribution of New Teachers in Chicago

Chicago's highest-needs schools are not disproportionately staffed with brand new teachers.

First, we look across different types of schools in Chicago to see whether there are systematic variations in the proportions of new teachers that they hire each year. In Tables A through D, comparing the "percent of schools" column with the "percent of new teachers" column shows that new teachers are hired at roughly the same rates across all Chicago school types, indicating that Chicago's highest-needs schools are not disproportionately staffed with brand new teachers, compared to other schools in the district.

Where Chicago New Teachers Start

The next question, then, is whether new Chicago teachers' academic capital characteristics are related to the student demographics and achievement of the schools in which they begin teaching. Here the answer is more mixed. Tables A and B show the types of Chicago elementary/middle schools in which new teachers began their careers, based on teachers' ACT composite scores and the competitiveness of colleges from which they graduated. Tables C and D show the same data at the high school level.

Elementary/Middle Schools: At the elementary/middle school level, we find some differences in the distribution of new teachers by ACT score (Table A).

Table A. Distribution of New Chicago Teachers in Elementary/Middle Schools, by Cohort and Teacher ACT Composite

	2001							2006						
Teacher ACT Score	% of Schools	% of New Teachers	18 and below	19 - 21	22 - 25	26 and above	Missing	% of Schools	% of New Teachers	18 and below	19 - 21	22 - 25	26 and above	Missing
New Teachers (%)	100%	100%	28%	20%	16%	9%	27%	100%	100%	21%	23%	18%	14%	24%
Percent Meeting/Exceeding Standards on ISAT														
Top Quartile	25	21	22	21	21	30	17	25	23	18	26	25	24	22
3rd Quartile	25	29	31	29	33	24	26	25	26	29	26	23	27	26
2nd Quartile	25	24	20	25	25	23	27	25	22	21	26	21	22	21
Lowest Quartile	25	26	28	24	21	23	30	25	29	32	22	31	27	31
Prior Year School ITAC Percentile														
Top Quartile	25	23	18	19	30	**39**	22	25	28	26	28	26	29	30
3rd Quartile	25	32	28	39	35	30	32	25	28	28	28	27	31	29
2nd Quartile	25	23	28	21	18	19	25	25	25	25	28	24	19	25
Lowest Quartile	25	22	26	21	17	12	22	25	19	21	16	23	21	16
Percent Minority Students														
0 - 49%	6	4	4	5	4	3	3	6	5	4	4	7	5	4
50 - 89%	21	22	23	21	21	**34**	21	19	19	16	17	20	18	21
90 - 98%	20	26	24	30	30	19	25	23	25	28	27	20	24	25
99 - 100%	53	48	49	44	45	45	52	53	52	52	51	53	54	50
Percent Low Income Students														
0 - 49%	9	5	4	7	6	8	3	10	8	5	6	10	8	8
50 - 89%	30	28	29	28	21	26	30	24	23	25	19	24	21	24
90 - 100%	62	68	67	66	73	66	67	67	70	71	75	66	71	67

Table B. Distribution of New Chicago Teachers in Elementary/Middle Schools, by Cohort and Teacher College Competitiveness

	2001						2006					
Teacher College Competitiveness	% of Schools	% of New Teachers	Low Selectivity	Medium Selectivity	High Selectivity	Missing	% of Schools	% of New Teachers	Low Selectivity	Medium Selectivity	High Selectivity	Missing
New Teachers (%)	100%	100%	18%	56%	8%	18%	100%	100%	13%	50%	9%	28%
Percent Meeting/Exceeding Standards on ISAT												
Top Quartile	25	21	25	19	27	20	25	23	29	22	29	20
3rd Quartile	25	29	**40**	28	15	25	25	26	27	24	22	31
2nd Quartile	25	24	17	26	26	26	25	22	19	25	17	20
Lowest Quartile	25	26	18	27	32	30	25	29	25	29	32	29
Prior Year School ITAC Percentile												
Top Quartile	25	23	22	22	30	23	25	28	22	25	36	34
3rd Quartile	25	32	33	33	36	29	25	28	30	29	30	26
2nd Quartile	25	23	23	24	24	21	25	25	28	26	20	22
Lowest Quartile	25	22	21	21	11	26	25	19	20	20	14	17
Percent Minority Students												
0 - 49%	6	5	7	3	2	4	6	5	4	6	3	4
50 - 89%	21	23	30	21	18	22	19	19	26	17	**29**	15
90 - 98%	20	26	29	25	27	25	23	25	27	24	18	28
99 - 100%	53	48	35	51	53	49	53	52	43	54	50	52
Percent Low Income Students												
0 - 49%	9	5	6	4	5	6	10	8	8	6	13	7
50 - 89%	30	28	34	26	24	25	24	23	25	23	17	23
90 - 100%	62	68	60	69	71	69	67	70	67	71	69	70

■ 10 points or more above expected value if distribution were the same for all new teachers

■ 10 points or more below expected value if distribution were the same for all new teachers

The initial sorting of recent cohorts of new elementary/ middle school teachers likely plays a limited role in the overall maldistribution of teacher qualifications across such schools in Chicago.

However, the degree of sorting across school types is less than what one might expect given the inequity of ITAC scores that we have shown here and in other IERC reports. For example, in 2001, new teachers with ACT scores of 26 and above were more likely to teach in schools in the highest ITAC quartile, but by 2006 the differences in the distribution of new teachers by school ITAC quartile were quite minor across elementary/middle schools. We find some sorting of new elementary/middle school teachers by college competitiveness as well—although not always in the expected direction (Table B). In 2006, there were virtually no discrepancies of 10 percentage points or greater in the distribution of new teachers by college competitiveness category among the various types of Chicago elementary/middle schools.

Post-entry shifting appears to contribute most to the overall inequities in the distribution of teacher qualifications that we find in elementary/middle schools in Chicago.

These results together indicate a fairly random distribution of teachers with varying levels of academic capital to different types of Chicago elementary/middle schools. This suggests that the initial sorting of recent cohorts of new elementary/middle school teachers likely plays a limited role in the overall maldistribution of teacher qualifications across such schools in Chicago. While we do not see large differences in hiring patterns across elementary/middle schools upon entry, an earlier study (DeAngelis & Presley, 2007) showed that sorting takes place after teachers' initial entry through teachers' transitions from the profession or to other schools. It is this post-entry shifting that appears to contribute most to the overall inequities in the distribution of teacher qualifications that we find in elementary/middle schools in Chicago.

New teachers with varying levels of academic capital are still distributed unequally across Chicago high schools, which indicates that inequities in ITAC scores will likely remain an issue for Chicago high schools.

High Schools: At the high school level, the picture changed in interesting ways between 2001 and 2006. In 2001, new teachers were somewhat evenly distributed across different types of high schools with regard to their ACT scores (Table C). In that same year, however, new teachers from highly selective colleges were much more likely to begin at high performing and high ITAC schools, and much less likely to start at high minority schools (Table D).* Thus, undergraduate college selectivity seemed to be driving new teacher sorting across high schools in 2001. But by 2006, a different picture emerges, whereby high ACT new teachers were much more likely than other teachers to start at top performing and high ITAC schools. By 2006 it is only new Chicago teachers from low selectivity colleges that are unevenly distributed. Such teachers were more likely to begin at the highest minority and highest poverty schools in 2006. It is difficult to explain these changes, especially since teachers' ACT scores are not generally known in the recruitment

* We note that school ITAC scores are not known to personnel in schools, so the apparent sorting related to this unknown measure may mean other school characteristics that *are* known to teachers are related to ITAC, or that this sorting is actually by chance.

Table C. Distribution of New Chicago Teachers in High Schools, by Cohort and Teacher ACT Composite

	2001							2006						
Teacher ACT Score	% of Schools	% of New Teachers	18 and below	19 - 21	22 - 25	26 and above	Missing	% of Schools	% of New Teachers	18 and below	19 - 21	22 - 25	26 and above	Missing
New Teachers (%)	100%	100%	28%	20%	16%	9%	27%	100	100%	21%	23%	18%	14%	24%
Percent Meeting/Exceeding Standards on PSAE														
Top Quartile	25	28	27	29	28	33	26	25	29	22	30	25	**44**	19
3rd Quartile	25	24	20	26	**35**	26	17	25	15	39	**35**	30	17	21
2nd Quartile	25	22	27	22	18	13	25	25	32	35	20	38	30	36
Lowest Quartile	25	26	25	22	19	28	32	25	14	14	15	8	0	**24**
Prior Year School ITAC Percentile														
Top Quartile	25	27	9	31	30	**43**	25	25	33	30	30	35	**44**	22
3rd Quartile	25	30	35	32	33	25	27	25	30	28	30	30	28	32
2nd Quartile	25	23	29	22	22	16	25	25	20	20	20	13	16	29
Lowest Quartile	25	20	27	15	15	16	23	25	18	23	20	22	12	17
Percent Minority Students														
0 - 49%	1	2	0	2	2	5	3	2	2	4	3	1	2	1
50 - 89%	30	35	44	44	35	**33**	28	29	31	23	38	30	**41**	20
90 - 98%	26	18	15	15	23	18	19	29	28	30	28	29	25	28
99 - 100%	42	44	43	39	40	44	50	41	40	43	31	40	32	**51**
Percent Low Income Students														
0 - 49%	9	11	9	14	7	15	13	10	7	5	3	4	13	5
50 - 89%	48	44	47	51	47	44	39	41	49	45	**61**	53	48	41
90 - 100%	43	44	44	36	47	41	48	49	45	50	36	43	40	53

Table D. Distribution of New Chicago Teachers in High Schools, by Cohort and Teacher College Competitiveness

	2001						2006					
Teacher College Competitiveness	% of Schools	% of New Teachers	Low Selectivity	Medium Selectivity	High Selectivity	Missing	% of Schools	% of New Teachers	Low Selectivity	Medium Selectivity	High Selectivity	Missing
New Teachers (%)	100%	100%	18%	56%	8%	18%	100%	100%	13%	50%	9%	28%
Percent Meeting/Exceeding Standards on PSAE												
Top Quartile	25	28	19	28	**51**	23	25	29	15	31	35	27
3rd Quartile	25	24	19	29	22	18	25	25	27	27	18	24
2nd Quartile	25	22	28	20	10	28	25	32	**47**	28	34	33
Lowest Quartile	25	26	33	24	17	31	25	14	10	14	13	16
Prior Year School ITAC Percentile												
Top Quartile	25	27	19	23	**49**	30	25	33	30	33	40	30
3rd Quartile	25	30	22	32	37	25	25	30	37	26	29	32
2nd Quartile	25	23	**33**	25	7	23	25	20	19	21	13	22
Lowest Quartile	25	20	25	20	7	22	25	18	14	20	18	17
Percent Minority Students												
0 - 49%	1	2	0	2	2	4	2	2	4	2	0	2
50 - 89%	30	35	33	41	**49**	19	29	31	22	36	39	23
90 - 98%	26	18	17	17	21	20	29	28	22	27	27	31
99 - 100%	42	44	50	40	29	**57**	25	40	**51**	36	34	44
Percent Low Income Students												
0 - 49%	9	11	6	11	16	14	10	7	4	7	6	8
50 - 89%	48	44	50	48	49	34	41	49	40	54	56	43
90 - 100%	43	44	0	41	35	53	49	45	**56**	40	37	51

There is some sorting of new high school teachers in Chicago by their academic capital characteristics.

10 points or more above expected value if distribution were the same for all new teachers

10 points or more below expected value if distribution were the same for all new teachers

process. However, the fact that new teachers with varying levels of academic capital are still distributed unequally across Chicago high schools indicates that inequities in ITAC scores will likely remain an issue for Chicago high schools even if all teachers left their initial high schools at similar rates, which we know is not the case (DeAngelis & Presley, 2007).

Summary: A Closer Look at Inexperienced and New Teachers

Our comparisons of inexperienced and experienced teachers in Chicago versus inexperienced and experienced teachers elsewhere in the state confirmed that Chicago is gaining ground with regard to inexperienced teachers' academic capital characteristics. We examined the distribution of brand new teachers in Chicago in 2001 and 2006 and found that different types of schools in Chicago are not disproportionately staffed with brand new teachers. However, it is important to remember that the vast majority of Chicago schools fall into the lowest statewide achievement quartile and that, across the state as a whole, schools with lower student performance are disproportionately staffed with inexperienced teachers.

We then delve further to examine whether there was any relationship between brand new teachers' academic capital characteristics and the different student demographic and achievement characteristics of the schools in which these teachers initially work. We find no large, systematic differences in new teacher hiring patterns between school types at the elementary/middle school level in Chicago. This suggests that unequal access to teacher academic capital in Chicago elementary/middle schools is largely the result of teacher transitions after initial entry. In Chicago high schools, on the other hand, we find some evidence that new teachers are being sorted upon initial entry—in 2001 we find a link between new teachers' college competitiveness and their initial school type and in 2006 there appears to be a relationship between new teachers' ACT composite scores and their initial school type. These findings indicate that the uneven distribution of ITAC at the high school level in Chicago may continue to pose a challenge.

ITAC and Student Achievement

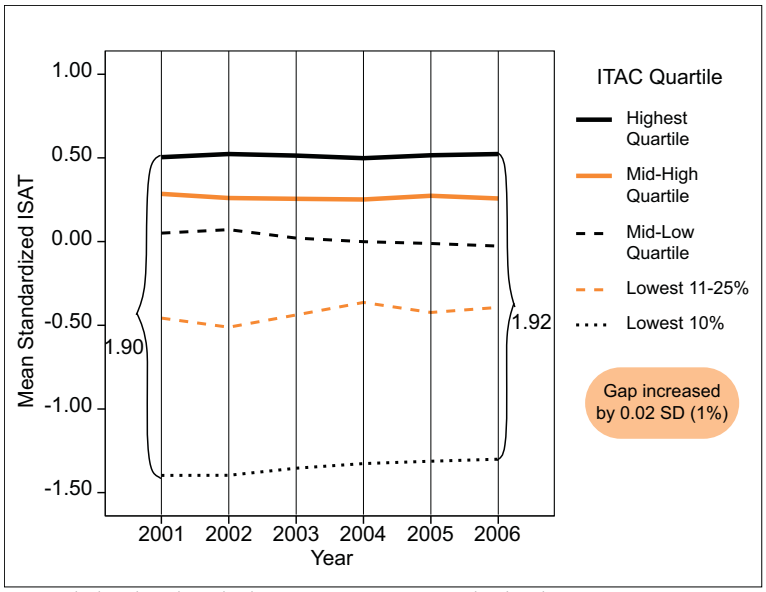
In this final section, we return to our wider view of all teachers in schools and explore the relationship between ITAC and both school achievement levels and school achievement gains. Our achievement measures are based on the proportion of students meeting or exceeding the proficiency standards on two statewide achievement examinations: the Illinois Standards Achievement Test (ISAT) administered in elementary and middle schools, and the Prairie State Achievement Examination (PSAE) given in high schools.

The Relationship between ITAC and Achievement Levels

First, we look at the relationship between ITAC levels and school achievement levels. Since passing levels on these exams varied widely from year-to-year due to scoring changes, we standardized each school's test results for each year to determine performance levels relative to other schools that year and present these results in terms of standardized ISAT and PSAE scores in this section. (See the Appendix for a comparison of Illinois achievement test results and these standardized scores.) Figure 12 shows that elementary/middle schools in lower ITAC quartiles consistently have lower average standardized ISAT scores, with a large gap between the lowest 10 percent and lowest 11 to 25 percent of schools by ITAC. (Remember from Figure 2 that average ITAC scores remained quite flat for elementary/middle schools between 2001 and 2006.) The achievement gap between the lowest 10 percent and the highest quartile of elementary/middle schools by ITAC actually

Elementary/middle schools in lower ITAC quartiles consistently have lower average standardized ISAT scores, with a large gap between the lowest 10% and lowest 11-25% of schools by ITAC.

Figure 12. Average Standardized ISAT Score, by Elementary/Middle School ITAC Quartile



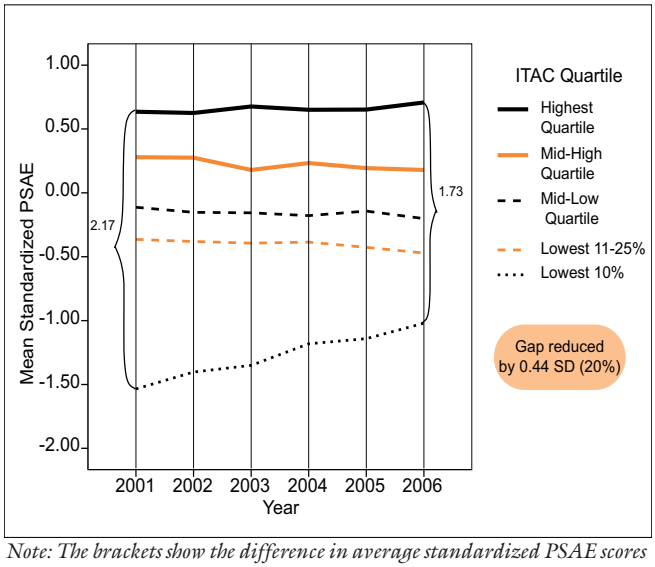
Note: The brackets show the difference in average standardized ISAT scores between the lowest group and the highest group.

increased by 1 percent (from 1.90 standard deviations in 2001 to 1.92 standard deviations in 2006).

The achievement gap between the lowest 10% and the highest quartile of high schools each year by ITAC closed by 20% from 2001 to 2006.

PSAE results show a similar gap for high schools, though it has closed considerably over the period of this study (Figure 13). The achievement gap between the lowest 10 percent and the highest quartile of high schools each year by ITAC closed by 20 percent (from 2.17 standard deviations in 2001 to 1.73 in 2006). Remember that, in contrast to elementary/middle schools, high school ITACs showed modest improvement from 2002 onwards (Figure 2), driven primarily, as we have shown, by ITAC gains in the lowest ITAC schools—the leveling up effect. This initial picture suggests that improvements in the lowest-ITAC schools appear to be related to improved school performance in such high schools.

Figure 13. Average Standardized PSAE Score, by High School ITAC Quartile



Note: The brackets show the difference in average standardized PSAE scores between the lowest group and the highest group.

ITAC differences are associated with positive achievement differences, especially at the high school level, even within similar school contexts.

Of course, student demographics play a large role in school achievement and are closely linked to schools' ITAC scores, so it is important to take school context into account as well when looking at the relationship between ITAC and achievement. We begin by examining test results across schools within the same poverty and minority categories but with different ITAC levels, aggregated over all six years of the study. Tables 10 and 11 do this by providing the average standardized ISAT and PSAE results for all years combined at different ITAC levels for high poverty, high minority schools compared to schools with low poverty and low minority concentrations.[6] The bottom row in each table shows the differences in average achievement between ITAC categories while holding poverty and minority categories constant. These tables show that higher ITACs are associated with higher achievement levels, especially in high schools, even within similar school contexts.

(Note, however, that achievement differences are still strongly associated with student demographics—the performance of students in high poverty, high minority schools with high ITAC scores is still, on average, more than two standard deviations below that of students in low poverty, low minority schools with low ITACs.)

Even more-advantaged elementary/middle schools benefit from high teacher academic capital.

In elementary/middle schools (Table 10), the standardized ISAT score for high poverty, high minority schools in the highest ITAC quartile was 0.39 standard deviations higher than for demographically similar schools in the lowest 10 percent of schools by ITAC. In low poverty, low minority elementary/middle schools, the achievement difference between the highest quartile and lowest 10 percent by ITAC was 0.23 standard deviations, which shows that even more-advantaged schools benefit from high teacher academic capital.

Table 10. Student Achievement by ITAC Quartile (Elementary/Middle Schools)

	High Poverty-High Minority		Low Poverty-Low Minority	
ITAC Quartile	**N**	**Mean ISAT***	**N**	**Mean ISAT***
Lowest 10%	996	-1.84	27	0.79
Lowest 11-25%	557	-1.61	201	0.76
Middle-Low Quartile	275	-1.44	636	0.86
Middle-High Quartile	75	-1.53	1,058	0.87
Highest ITAC Quartile	39	-1.45	1,629	1.02
Difference between Lowest 10% and Highest Quartile		*+0.39*		*+0.23*

* Mean ISAT is reported in standard deviation units to control for test differences across years.

At the high school level (Table 11), it is first important to note that there were very few high poverty, high minority schools in the middle-high and highest ITAC quartiles, which illustrates the limited access that such students have to schools with even above-average teacher academic capital. The implications of this differential access are more striking in light of the differences in achievement we see at different ITAC levels in high poverty, high minority high schools as compared to low poverty, low minority high schools. High poverty, high minority high schools from the middle-high ITAC quartile registered a 0.50 standard deviation advantage in average standardized PSAE scores compared to schools in the lowest ITAC category. The comparable advantage in low poverty, low minority high schools was only 0.16 standard deviations, which suggests that ITAC is especially important in disadvantaged high schools. There are simply not enough high poverty, high minority high schools with ITAC scores in the highest quartile to reliably estimate the achievement differences between the highest and lowest ITAC levels. But one only wonders what could be achieved in our most disadvantaged high schools when we see that, even for advantaged schools, average performance is 0.45 standard deviations higher in high schools with highest quartile ITACs compared to high schools in the second highest ITAC quartile (1.03 compared to 0.58).

ITAC is especially important in high poverty, high minority high schools.

Table 11. Student Achievement by ITAC Quartile (High Schools)

ITAC Quartile	High Poverty-High Minority		Low Poverty-Low Minority	
	N	Mean PSAE*	N	Mean PSAE*
Lowest 10%	78	-2.49	13	0.42
Lowest 11-25%	31	-2.46	37	0.40
Middle-Low Quartile	22	-2.21	134	0.45
Middle-High Quartile	9	-1.99	280	0.58
Highest ITAC Quartile	2	N=2	420	1.03
Difference between Lowest 10% and Middle-High Quartile		*+0.50*		*+0.16*
Difference between Lowest 10% and Highest Quartile		small N		*+0.61*

* Mean PSAE is reported in standard deviation units to control for test differences across years.

Regression Analyses

Regression analysis provides a statistical way to examine student achievement while taking school context into consideration. To investigate the impact of ITAC on schools' percentages of students meeting or exceeding standards on the ISAT or PSAE, we used regression analysis to examine school achievement scores while statistically controlling for each school's percentage of inexperienced teachers and their poverty and minority student concentrations. For these analyses, we again combine all six years of data so standardized achievement measures are used to control for test differences across years.[7] We can compare the impact of each of the independent variables by looking at the standardized coefficient column, which shows the effects of a one standard deviation increase in each predictor on standardized achievement. Independent variables with standardized coefficients further from zero have a larger impact on student achievement levels.

ITAC has a larger impact on achievement levels in high schools than in elementary/ middle schools.

Table 12. ITAC Effects on Achievement Levels Controlling for School Contexts

	Standardized Coefficients	
	Elementary/Middle School	High School
ITAC	+0.09**	+0.23**
% Inexperienced Teachers	-0.08**	-0.02*
% Minority Students	-0.20**	-0.10**
% FRL Students	-0.62**	-0.60**

* = significant at the .05 level; ** = significant at the .01 level.

Looking at Table 12, we see that ITAC has a larger impact on achievement levels in high schools than in elementary/middle schools. Each standard deviation increase in ITAC is associated with a 0.09 standard deviation increase in standardized achievement scores in elementary/middle schools, compared to a 0.23 standard deviation increase in high schools. The impact of higher ITAC offsets that of schools'

proportions of inexperienced teachers, especially at the high school level, and also is larger than the unique impact of schools' student minority concentrations in high schools (after controlling for percent FRL students). However, ITAC has a smaller impact than schools' minority and FRL student concentrations in elementary/middle schools, and a smaller impact than schools' FRL student concentrations in high schools.

Higher ITAC offsets that of schools' proportions of inexperienced teachers, especially at the high school level.

ITAC Change and Achievement Gains within Schools

To this point, we have illustrated that schools with higher ITAC scores also tend to have higher achievement levels and that this holds even when we look at schools that are quite similar demographically, such as high poverty, high minority schools or low poverty, low minority schools. But what if this apparent ITAC "effect" simply reflects some other unmeasured and unaccounted for differences between schools, like the presence of a strong principal who can both attract teachers with high academic capital and raise student achievement independently? Can we really say that an improvement in ITAC within a single school makes a difference with regard to that school's achievement? Fortunately, the nature of our data—with multiple observations for each school over time—allows us to construct school "fixed effects" models to answer these questions. With such models, we can estimate the effects of ITAC changes *within* each school while simultaneously controlling for unmeasured differences across schools *and* observed changes to important predictors at each school (such as prior achievement, student demographics, and teacher experience) that may also affect school performance over time. Further, since we are controlling for each school's prior achievement, the models are essentially measuring the distance between one year's school achievement and the previous year's school achievement (i.e., school achievement gains).

We use these fixed effects models to show the relationship between ITAC change and achievement change by school level (Table 13). Since Chicago experienced substantial improvements in ITAC during the period of our study, we also estimate separate models for Chicago elementary/middle schools and Chicago high schools (Table 14). We control for each school's changes in percent inexperienced teachers and student minority and poverty concentrations, and we also include dummy variables for each year in our study to account for annual differences in the mean and distribution of test scores due to changes in the proficiency cutoff scores (not shown in tables). Since the PSAE was not administered in 2000, there are no prior achievement scores for the 2001 PSAE and the previous year is dropped from our analysis.

The results of these models are presented in terms of standardized coefficients for each predictor, which allow us to compare the effects of these school variables within and across models. The larger the magnitude of the standardized coefficient

(its distance from zero) the bigger the effect of that predictor, and negative coefficients mean that as the school variable increases achievement gains get smaller, while positive coefficients mean that achievement gains are larger as the predictor increases. The R-squared statistic indicates the proportion of variability in achievement gains that is explained by the model, so larger R-squared values mean the model is a better fit.

Table 13. ITAC Effects on Achievement Gains Controlling for School Contexts (Illinois)

	Standardized Coefficients	
	Elementary/Middle School	High School
ITAC	0.02**	0.00
% Inexperienced Teachers	-0.01	-0.04**
Previous Year's Test Score	0.23**	-0.12**
% Minority Students	-0.23**	-0.20*
% FRL Students	-0.01	-0.10**
R-Squared	0.78	0.19

* = significant at the .10 level; ** = significant at the .05 level.

Table 14. ITAC Effects on Achievement Gains Controlling for School Contexts (Chicago only)

	Standardized Coefficients	
	Elementary/Middle School	High School
ITAC	0.02*	0.06*
% Inexperienced Teachers	-0.02*	-0.02
Previous Year's Test Score	0.34**	0.26**
% Minority Students	-0.07	-0.38
% FRL Students	-0.05	-0.14
R-Squared	0.80	0.93

* = significant at the .10 level; ** = significant at the .05 level.

Student performance tends to improve when ITAC scores increase, even after controlling for changes in student demographics and teacher experience.

Tables 13 and 14 show that ITAC increases are associated with a statistically significant positive impact on achievement gains in elementary/middle schools statewide and a marginally significant positive impact at all school levels in Chicago. This means that, in all but non-Chicago high schools, student performance tends to improve when ITAC scores increase, even after controlling for changes in student demographics and teacher experience.

While the effects of within-school ITAC changes are quite modest, it is important to recognize that we were able to detect these ITAC effects with school-level performance measures that do not enable us to account for the impact of individual teachers or for improvements in student achievement beyond the proficiency threshold set by the state. Despite these limitations, it is clear that hikes in teachers' academic capital have positive ramifications for the state's students.

Summary: The Relationship between ITAC and Achievement

Our analyses reveal evidence of links between ITAC and achievement. We found a consistent and direct relationship between ITAC and school achievement levels. Among demographically similar schools, we found that ITAC differences are often associated with quite large achievement differences, especially in high poverty, high minority schools. Regression analyses show that ITAC has an independent effect on school achievement levels, even after controlling for other important school conditions, especially at the high school level. Finally, we found that increases in ITAC were associated with gains in achievement within a school after controlling for changes to student demographics and schools' concentrations of inexperienced teachers.

Increases in ITAC were associated with gains in achievement within a school.

Discussion

This report contains both good news and bad news for Illinois public schools. The good news is that teacher academic capital in Illinois' neediest schools improved over the period 2001-2006. The bad news is that there is still a considerable ITAC gap between the state's highest poverty, highest minority schools and the rest of its schools. It is noteworthy that these changes seen in Illinois appear to be occurring elsewhere as well. For example, studies in New York City (Boyd et al., 2007) and nationally (Gitomer, 2007) have found similar improvements in the distribution of teacher academic capital and in the academic capital of new teachers.

The improvements to teacher academic capital in Illinois' neediest schools might be related to the introduction of a new teacher basic skills test in September 2001. This more rigorous exam may have helped the state raise the floor on teacher qualifications enough to make an observable difference. In addition, it appears that the Highly Qualified Teacher provisions of No Child Left Behind (NCLB) may be having an impact on both teacher qualifications and the distribution of teachers. However, it is important to remember our finding that new teachers tend to bring increased academic capital, which policymakers must try to reconcile with NCLB's focus on the distribution of inexperienced teachers. Thus, if emphasis is placed too narrowly on leveling teacher experience, it might come at the expense of equalizing the distribution of teacher academic capital.

If emphasis is placed too narrowly on leveling teacher experience, it might come at the expense of equalizing the distribution of teacher academic capital.

In Chicago, one might imagine that Teach for America (TFA) was a major contributor to the changing academic profile of the district's new teachers. However, though TFA has been providing the district with new teachers from highly selective colleges since 2000, their share of the district's inexperienced teachers was only about 4.5 percent by 2008. Since our analysis extends only to the 2006 academic year, TFA recruitment probably contributes only very modestly to the changes that we observe for Chicago's inexperienced teachers. (Another program to recruit teachers to the city is the Chicago Fellows program through the New Teacher Project, but this program began only in the 2007 school year—after the period that we are analyzing in this report—so this could not have contributed to the changes we observe.) Chicago's school leadership has made its "teacher talent" initiative a key component of its strategy to improve the city's schools, and these efforts likely complement the state and federal policy initiatives that have been occurring simultaneously.

Next, it is important to note that the student achievement measures used here—the average percentage of students at each school meeting or exceeding state standards each year—leave much to be desired. They only capture changes in achievement at the state-defined thresholds for different cohorts of students each year. In addition, the achievement results are available only at the school level, making it impossible to do a value-added analysis linking individual teacher academic capital with the achievement gains of students in a particular class. Without better data, it is impossible to measure the full impact of ITAC. But in a study of New York City schools where individual teachers could be matched to individual students (Boyd et al., 2007), the evidence is promising.

The evidence that teacher academic capital is improving in our most disadvantaged schools is significant and gives rise to justified optimism.

In conclusion, it is clear that teacher academic capital is not a silver bullet—but it is equally clear that ITAC is a meaningful contributor to student achievement. The teacher characteristics combined in the ITAC are just a few of the many aspects of teacher quality—along with preparation for teaching, ongoing professional development, daily decisions about curriculum and instruction, and many other things—that together combine to influence student learning. However, the evidence that teacher academic capital is improving in our most disadvantaged schools is significant and gives rise to justified optimism.

It is possible to improve schools' teacher academic capital.

Which leads to the final point: it is possible to improve schools' teacher academic capital. While access to teacher academic capital is still unequal, some schools are making great strides in a short time. The challenge now is to continue to close the ITAC gaps, continue to improve teacher academic capital, and work to ensure that all Illinois schools provide working conditions suitable to the retention of these higher academic capital teachers. But ITAC changes would have to be quite large—not just tinkering around the edges—in order to make the kind of impact on achievement that is needed.

Implications of the Research

Academic capital is just one of many aspects of teacher quality that together with school environments influence student learning in schools. While teacher academic capital is not a silver bullet for improving the academic success of students, it is a meaningful contributor.

The evidence that teacher academic capital is improving in Illinois' neediest schools is significant, and points to some potential strategies for further increasing the quality of the state's teaching force. The findings of this report provide insight that both supports and challenges conventional wisdom on how best to bolster teacher quality:

Inexperienced teachers are not inherently bad for schools. The study raises questions about whether the proportion of inexperienced teachers in a school is the right policy lever on which to focus. The research finds that recent inexperienced teachers are bringing with them stronger academic capital—a factor whose positive effect on student performance tends to counter the negative impact of teacher inexperience. Focusing too narrowly on reducing the proportion of inexperienced teachers in a school might come at the expense of equalizing teacher academic capital across schools.

Raising standards for teacher qualifications pays off. Schools appear to have benefited from the teacher quality provisions of the No Child Left Behind Act of 2001, the introduction in Illinois in 2001 of a more rigorous basic skills test needed for certification, and the 2002 state requirement that all prospective teachers in Illinois pass that enhanced basic skills test before entering preparation programs. These policies have reduced the proportion of emergency-certified teachers in schools in the state and helped school districts and teacher preparation programs be more selective in the individuals they train, certify, and hire to teach in our public schools.

Principals and district human resources officers should take into consideration candidates' academic qualifications, and provide strong supports to keep new, academically-talented teachers in the classroom. As districts experience increases in applications for teaching positions, principals and human resources officers have the ability to be more selective in whom they hire. Unfortunately, in a recent study on teacher attrition in Illinois (DeAngelis & Presley, 2007), the IERC found that teachers with the highest ACT scores and degrees from the most competitive institutions are less likely to remain teaching in the lowest-performing schools. If this trend continues, the improvements in the distribution of Illinois' teacher academic capital in recent years could be eroded. State and district officials need to ensure that all school leaders are implementing effective mentoring and induction support for new teachers, and striving to improve their schools' teaching and learning climates.

Appendix: Comparison of Achievement Test Scores and Standardized Scores

Comparison of ISAT and Standardized ISAT (zISAT) Decile Cutoff Scores (Elementary/Middle School)

Decile	2001		2002		2003		2004		2005		2006	
	ISAT Max	zISAT Max	ISAT Max	zISAT Max	ISAT Max	zISAT Max	ISAT Max	zISAT Max	ISAT Max	zISAT Max	ISAT Max	zISAT Max
1	32.80	-1.63	34.30	-1.59	37.60	-1.56	40.50	-1.53	43.30	-1.60	56.60	-1.51
2	47.40	-.87	48.40	-.83	51.50	-.81	53.70	-.77	57.30	-.78	67.30	-.74
3	57.20	-.36	57.00	-.37	58.60	-.38	60.90	-.35	64.80	-.34	73.30	-.31
4	63.90	-.01	62.90	-.05	64.20	-.07	66.10	-.05	70.40	-.01	77.70	.00
5	68.60	.23	67.60	.20	68.90	.19	70.60	.21	74.20	.21	80.90	.23
6	72.50	.43	71.70	.42	72.80	.41	74.50	.43	78.10	.44	83.60	.43
7	76.70	.65	76.00	.65	76.60	.63	78.00	.63	81.30	.63	86.40	.63
8	80.90	.87	80.00	.87	81.20	.89	82.10	.87	84.60	.82	89.30	.84
9	85.70	1.12	85.30	1.15	86.10	1.16	86.80	1.14	88.90	1.07	92.30	1.05
10	100.00	1.86	99.40	1.91	99.80	1.93	99.70	1.88	100.00	1.72	100.00	1.60

Comparison of PSAE and Standardized PSAE (zPSAE) Decile Cutoff Scores (High School)

Decile	2002		2003		2004		2005		2006	
	PSAE Max	zPSAE Max	PSAE Max	zPSAE Max	PSAE Max	zPSAE Max	PSAE Max	zPSAE Max	PSAE Max	zPSAE Max
1	25.60	-1.56	26.90	-1.50	30.10	-1.33	28.70	-1.42	25.60	-1.42
2	42.40	-.58	41.70	-.61	43.00	-.57	43.20	-.56	40.10	-.59
3	48.60	-.22	48.10	-.23	49.10	-.22	48.50	-.24	46.40	-.23
4	52.00	-.02	51.10	-.05	52.80	.00	51.60	-.05	50.60	.01
5	55.00	.16	54.60	.16	55.60	.17	55.40	.17	53.70	.18
6	58.20	.34	56.90	.30	58.70	.35	58.30	.35	56.60	.35
7	61.10	.51	60.00	.48	61.30	.50	61.40	.53	59.90	.53
8	65.20	.75	64.60	.76	65.00	.72	65.10	.75	64.30	.79
9	70.00	1.03	69.20	1.03	70.90	1.06	70.10	1.05	70.50	1.14
10	96.40	2.58	99.20	2.83	98.90	2.71	98.70	2.76	98.30	2.72

Endnotes

1. We use the most recent calendar year to identify any academic year, so, for example, "2001" refers to the 2000-2001 academic year.

2. Due to changes in the timing and difficulty of the basic skills test that occurred during the time frame of our study, our measure of the proportion of teachers in a school who failed the basic skills test on their first attempt is based only on all teachers at the school who took the test prior to 2001.

3. The observed weights from other years differed very little from the base year as the relationship among ITAC components varied only slightly.

4. We remind the reader that we excluded from the basic skills component of ITAC the scores of teachers who took the revised, and more stringent, basic skills test that was introduced in 2001.

5. Note that the ITAC quartiles are calculated by school level and are calibrated each year, so a high school and elementary/middle school with identical ITAC scores may fall into different quartiles, while a school may be in the lowest quartile one year but not the next, and two schools with identical ITAC scores in different years may fall in different ITAC quartiles as the distributions of scores change.

6. We define "high poverty, high minority" schools as those with minority concentrations of 90 percent or higher and poverty concentrations of 90 percent or higher. "Low poverty, low minority" schools have less than 50 percent minority students and less than 10 percent poverty. ITAC quartiles are defined by year and grade level, such that 25 percent of elementary/middle schools and 25 percent of high schools fall into each quartile annually.

7. We also ran these regression models for each of the six years (2001 through 2006) separately. The results of the year-by-year models were very similar to the pooled regression results reported in Table 12.

References

Barron's (2003). *Profiles of American colleges.* Woodbury, NY: Barron's Educational Series, Inc.

Boyd, D., Lankford, H., Loeb, S., Rockoff, J., & Wyckoff, J. (2007, September). *The narrowing gap in New York City teacher qualifications and its implications for student achievement in high poverty schools (*Working Paper 10). Washington, DC: Center for Analysis of Longitudinal Data in Education Research: The Urban Institute.

DeAngelis, K. J., & Presley, J. B. (2007). *Leaving schools or leaving the profession: Setting Illinois' record straight on new teacher attrition* (IERC 2007-1). Edwardsville, IL: Illinois Education Research Council.

DeAngelis, K. J., Presley, J. B., & White, B. R. (2005). *The distribution of teacher quality in Illinois* (IERC 2005-1). Edwardsville, IL: Illinois Education Research Council.

Gitomer, D. H. (2007). *Teacher quality in a changing policy landscape: Improvements in the teacher pool.* Princeton, NJ: Educational Testing Service.

Presley, J. B., White, B. R., & Gong, Y. (2005). *Examining the distribution and impact of teacher quality in Illinois* (IERC 2005-2). Edwardsville, IL: Illinois Education Research Council.

Rice, J. K. (2003). *Teacher quality: Understanding the effectiveness of teacher attributes.* Washington, D.C.: Economic Policy Institute.

Wayne, A. J. & Youngs, P. (2003). Teacher characteristics and student achievement gains: A review. *Review of Educational Research*, 73(1), 89-122.

Contact the IERC toll-free at 1-866-799-IERC (4372)
or by email at ierc@siue.edu.

http://ierc.siue.edu

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-20 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.