



Illinois Education Research Council

**Teacher Academic Capital
in Illinois, 2001-2006:
Closing the Gap?**

IERC Symposium

June 10, 2009

This study was funded by the Joyce Foundation.



Context

- Teachers matter a lot and there are large differences in teacher effectiveness
- There are links between (some) teacher qualifications and student performance at both the classroom level and the school level
- Teacher qualifications are not distributed equally across schools
 - Schools with high proportions of poor and minority students are particularly disadvantaged



Research Questions

- How have teacher qualifications changed over time in Illinois in recent years?
- Do all Illinois students have equal access to teacher qualifications?
- If there are gaps in students' access, are they widening or closing?
- How were teacher qualifications related to student achievement in Illinois during this time period?



Data

- All Illinois public schools and public school teachers over six years (2001-2006)
 - **Approximately 4,200 schools and 125,000 teachers per year**
- School Data (from school report cards and CCD)
 - **Concentrations of poor (FRL) and minority (non-white) students**
 - **Grade level served (elem/mid or HS)**
 - **Locale**
 - **Region of state**
 - **Student achievement (% passing state tests)**
- Teacher Data (from state administrative records and ACT)
 - **Years of experience**
 - **Certifications**
 - **Undergraduate college (selectivity via Barron's)**
 - **Basic Skills Test results**
 - **ACT scores**



The Index of Teacher Academic Capital (ITAC)

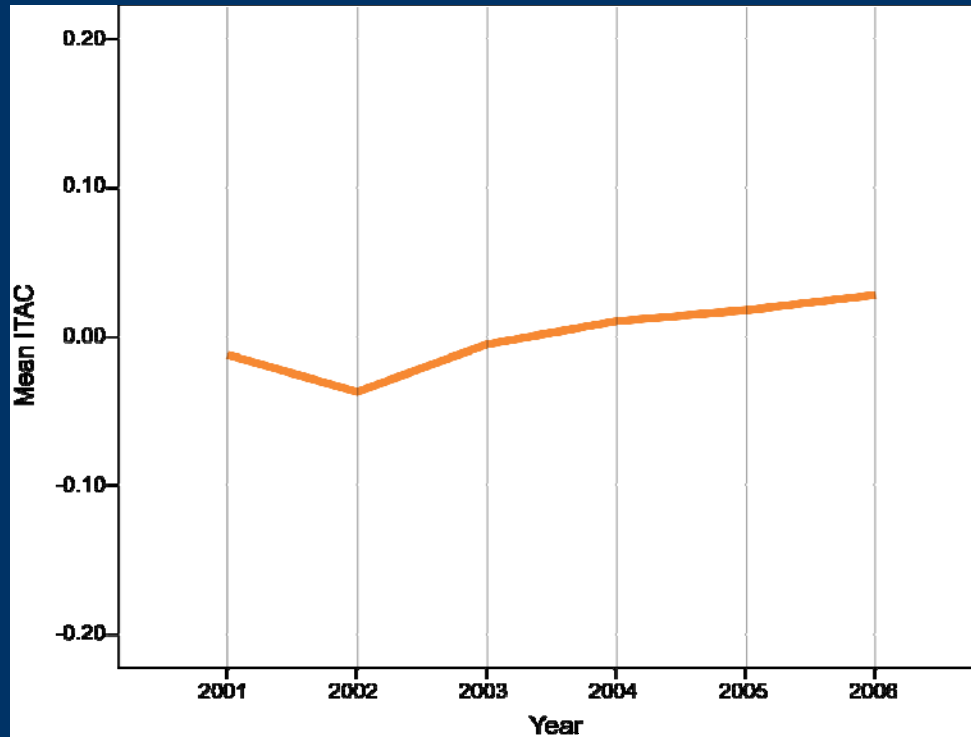
- ITAC statistically combines five **school-level** measures of teacher academic qualifications into a single indicator to capture the average collective level of academic preparation of teachers in each school each year. ITAC components (*and loadings*):
 1. **Average teacher ACT Composite scores (0.91)**
 2. **Average teacher ACT English scores (0.90)**
 3. **% of teachers failing Basic Skills Test (-0.36)**
 4. **% of emergency certified teachers (-0.50)**
 5. **Teachers' mean undergrad college competitiveness (0.45)**
- ITAC has a mean of zero and a standard deviation of one in 2003
- We also investigate each school's proportion of inexperienced teachers (3 or fewer years of experience) – but separate from ITAC



**How have teacher
qualifications changed in
Illinois in recent years?**



Slight ITAC improvement from 2001 to 2006



ITAC Component	Change
Emergency Certified	-0.6
Failed Basic Skills Test	+0.2
ACT Composite	+0.2
ACT English	-0.0
College Competitiveness	+0.0

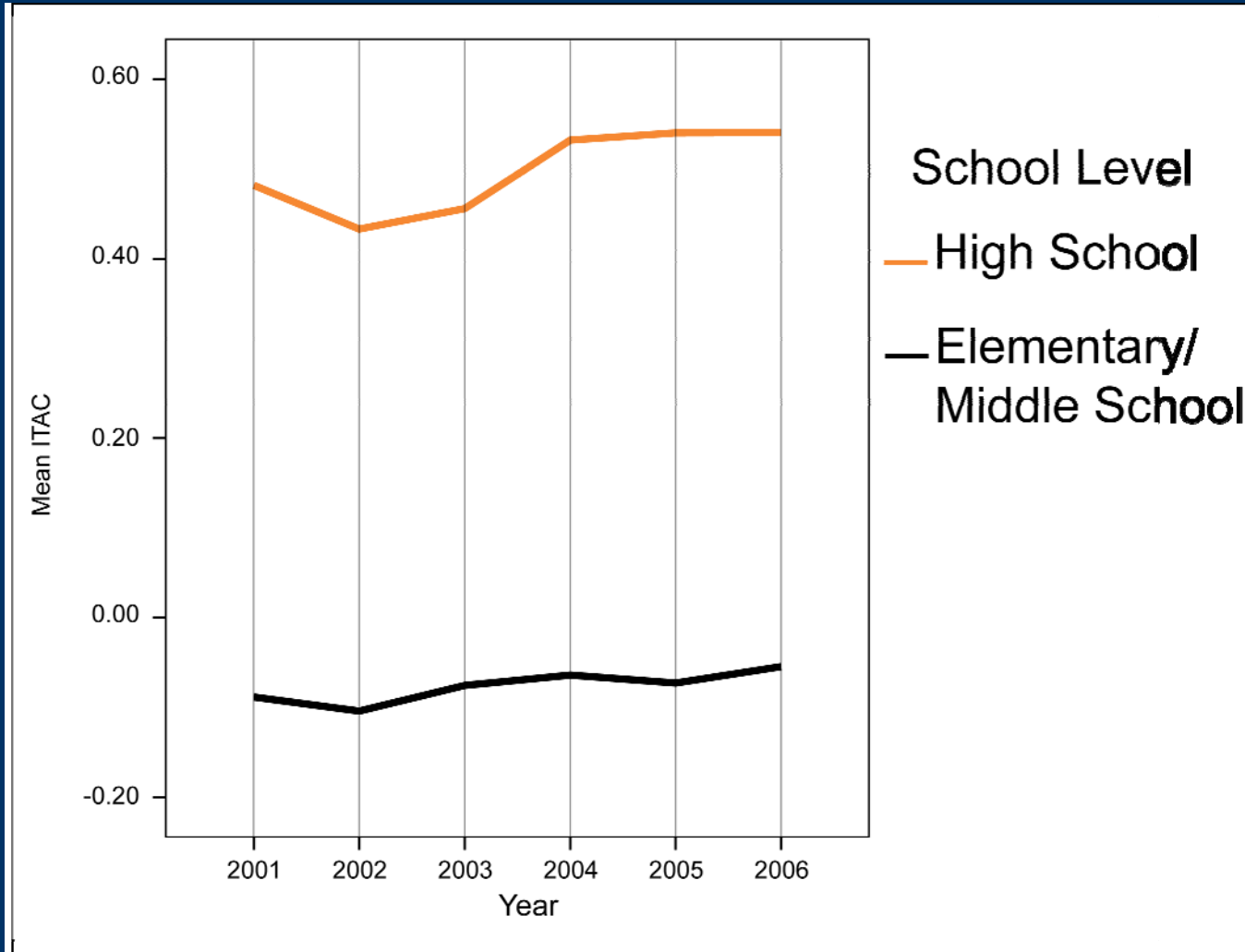


**Do all Illinois students
have equal access to
teacher qualifications?**

**If there are gaps in
students' access, are they
widening or closing?**

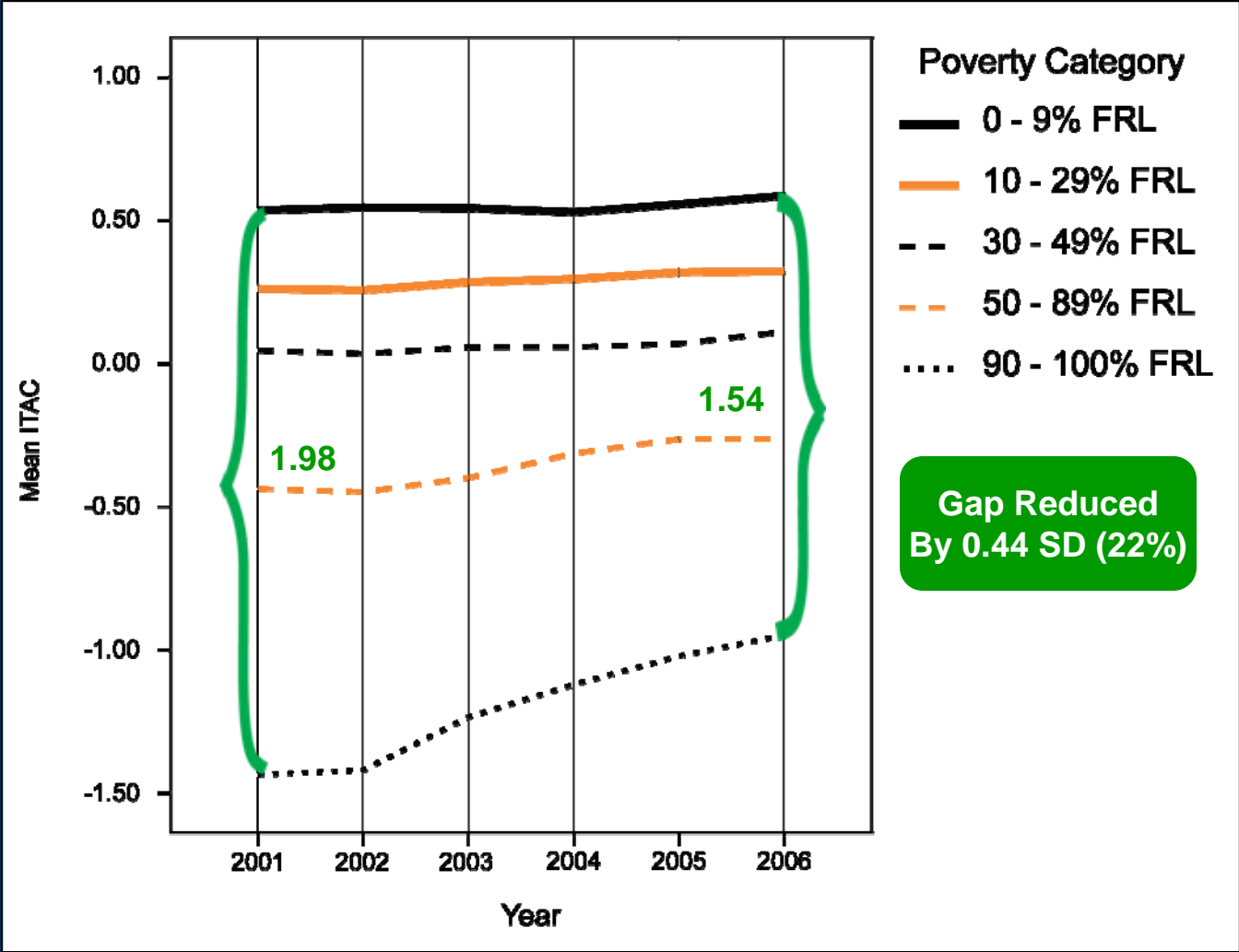


Large ITAC differences by school level





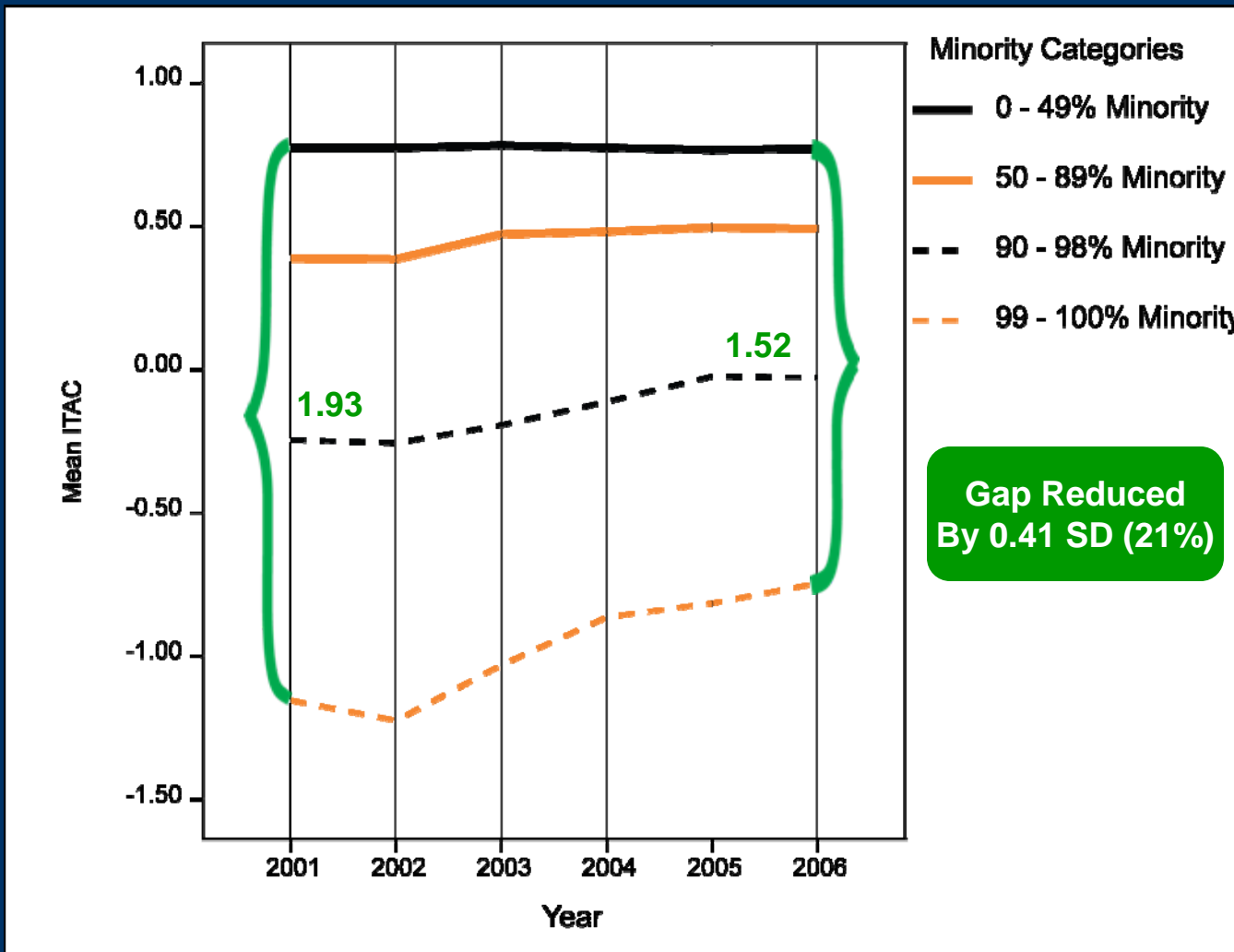
Even larger ITAC differences by student poverty category...



... but gaps are closing.



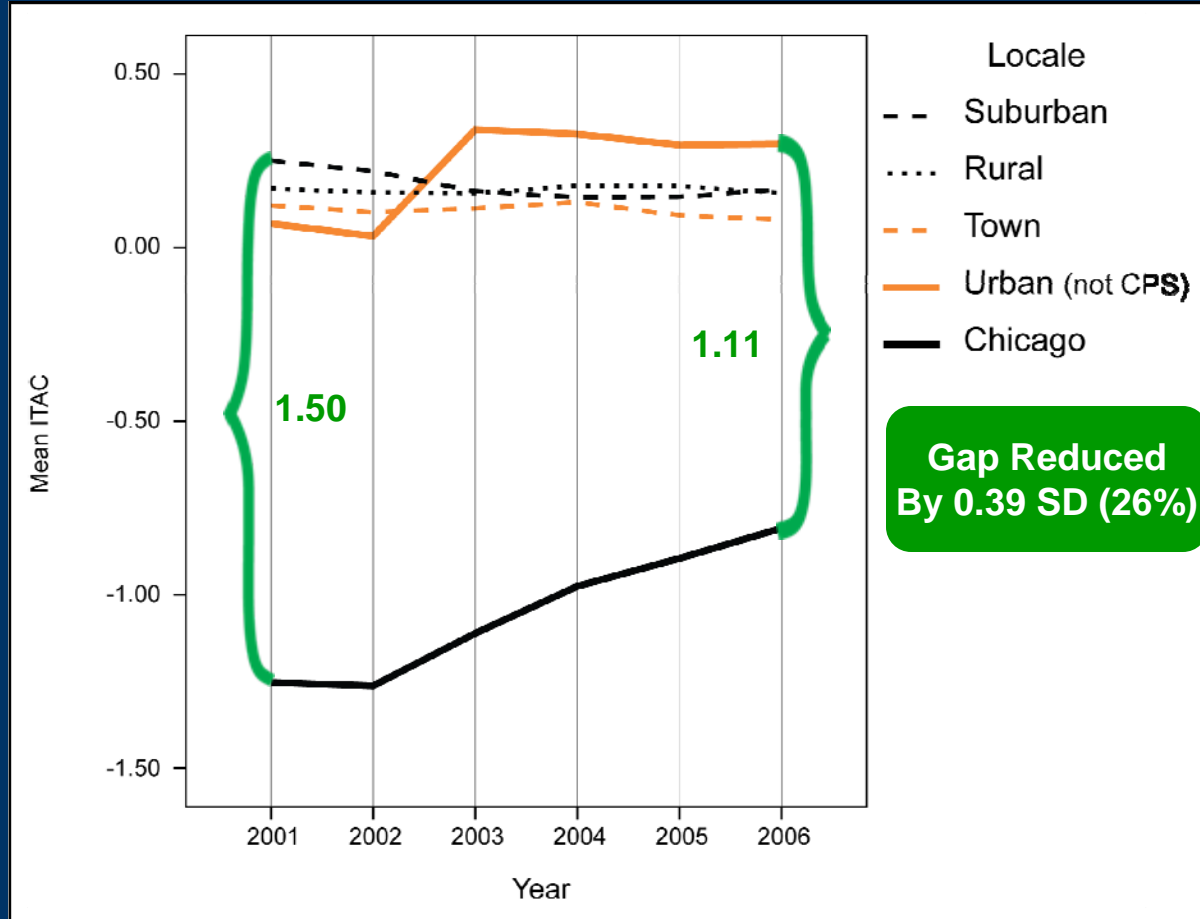
Also by student minority category...



... but gaps are closing.



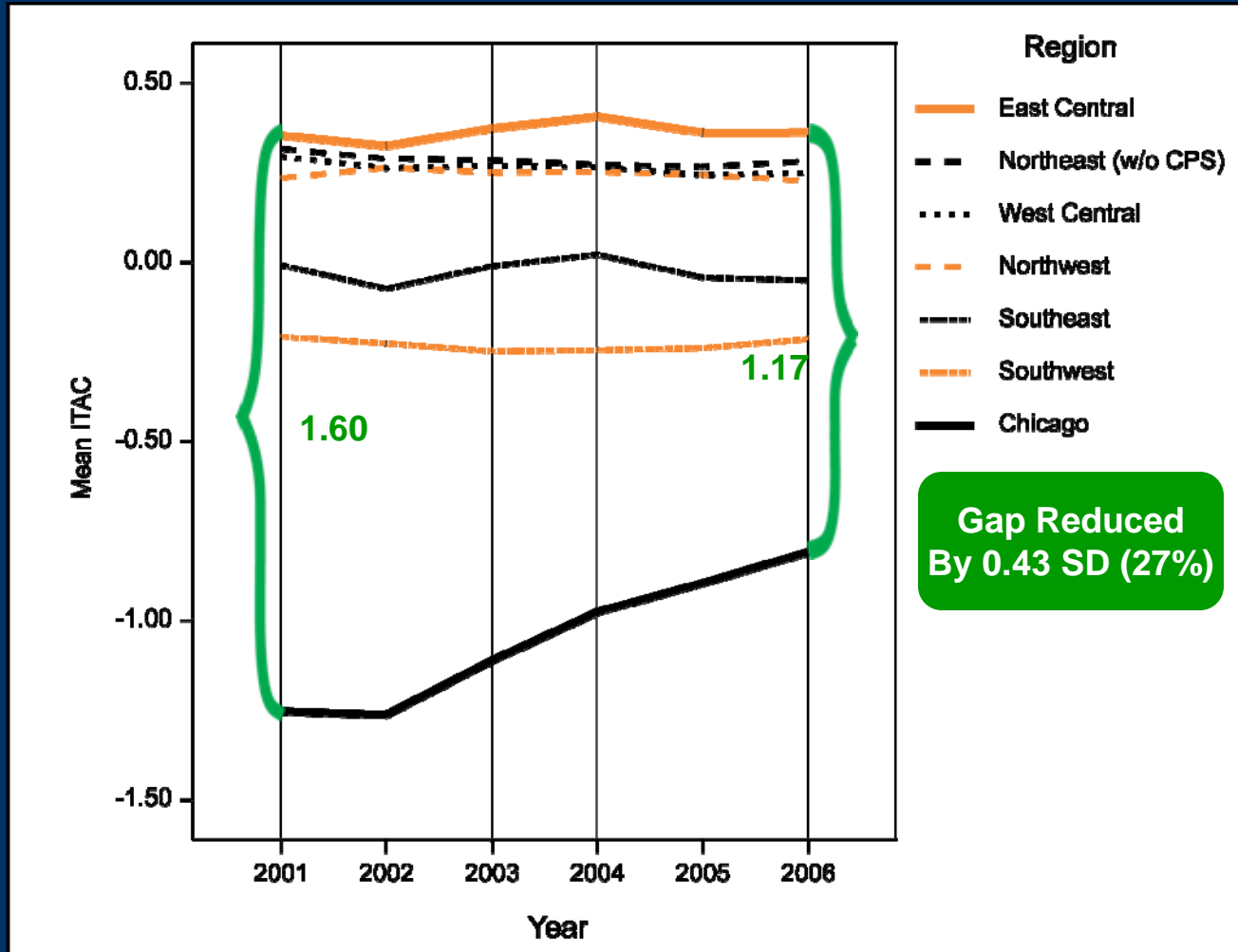
And Chicago versus other locales...



... but gap is closing (and Urban non-CPS improved also).



Finally, Chicago versus other regions...



... and gap is still closing.



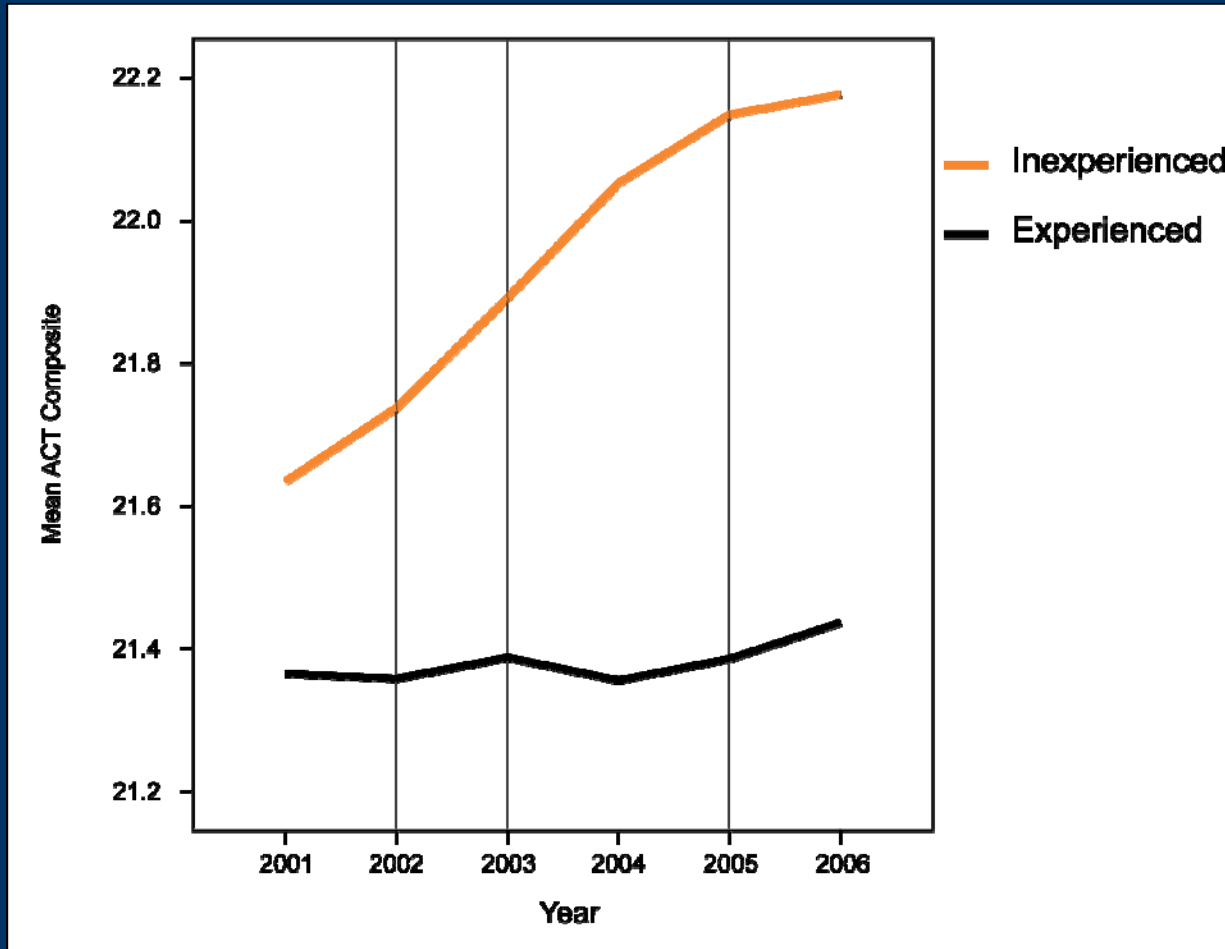
Large improvements to ITAC in Chicago

ITAC Component	Change
ITAC	+0.5
Emergency Certified	-5.6
Failed Basic Skills Test	+1.4
ACT Composite	+0.8
ACT English	+0.6
College Competitiveness	+0.1

How did ITAC change?



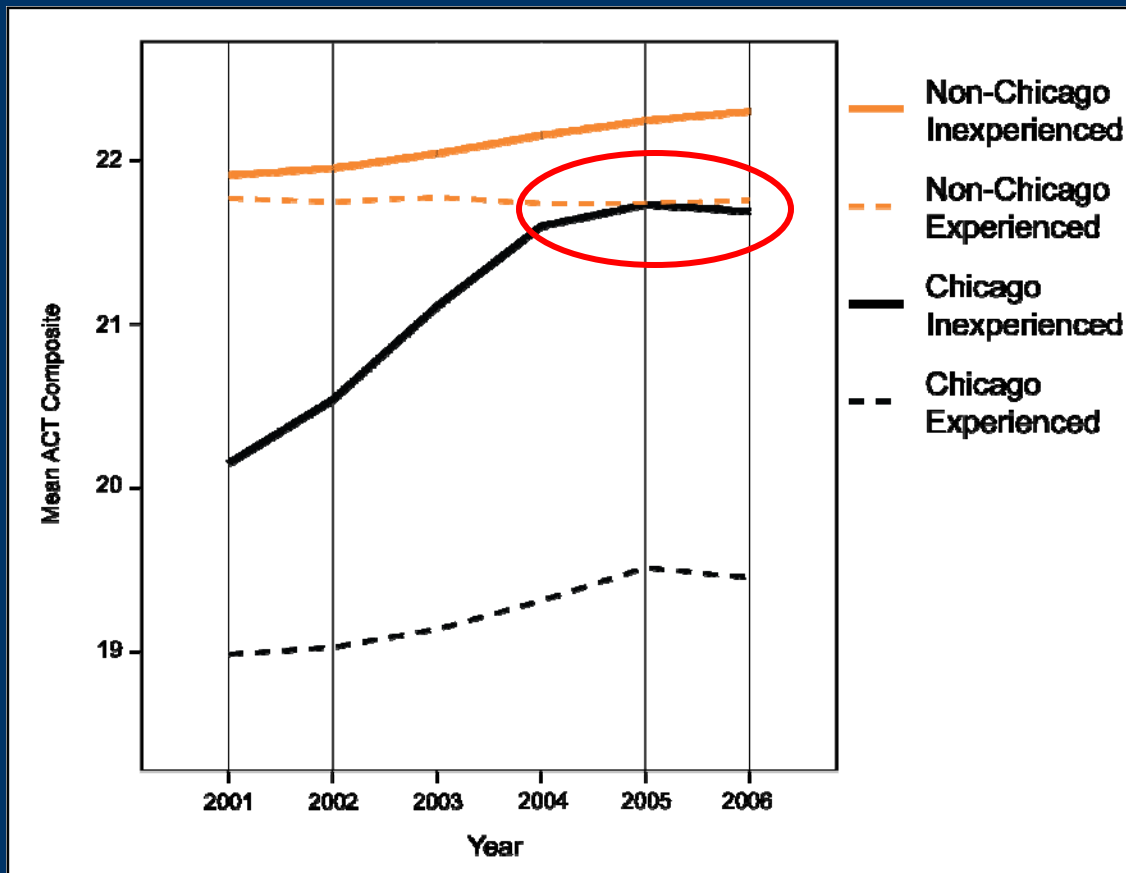
Inexperienced teachers have higher average ACT Composites...



... and the gap is widening.



Regardless of experience level, ACT Composite averages are lower in Chicago...



... but recent new teacher cohorts in Chicago are improving more quickly and approaching experienced teachers elsewhere.



How were teacher qualifications related to student achievement in Illinois during this time period?



Even within demographically similar elementary/middle schools...

ITAC Quartile	High Poverty, High Minority		Low Poverty, Low Minority	
	N	Mean Test Score	N	Mean Test Score
Lowest 10%	996	-1.84	27	0.79
Lowest 11-25%	557	-1.61	201	0.76
Middle-Low	275	-1.44	636	0.86
Middle-High	75	-1.53	1058	0.87
Highest ITAC	39	-1.45	1629	1.02
Difference	+0.39		+0.23	

...schools with higher ITACs have higher achievement.



And ITAC appears to have an even larger impact in high poverty, high minority high schools

ITAC Quartile	High Poverty, High Minority		Low Poverty, Low Minority	
	N	Mean Test Score	N	Mean Test Score
Lowest 10%	78	-2.49	13	0.42
Lowest 11-25%	31	-2.46	37	0.40
Middle-Low	22	-2.21	134	0.45
Middle-High	9	-1.99	280	0.58
Highest ITAC	2	N=2	420	1.03
<i>Low to Mid-High</i>	<i>+0.50</i>		<i>+0.16</i>	
<i>Low to High</i>	<i>(Small N)</i>		<i>+0.61</i>	



Improving ITAC boosts achievement in elementary/middle schools statewide

School-Level Fixed Effects, Illinois

Predictors	Elementary/Middle		High School	
	Stand. Coeff.	Sig.	Stand. Coeff.	Sig.
% Inexperienced	-0.01	0.16	-0.04	0.00
% Minority	-0.23	0.00	-0.20	0.05
% FRL	-0.01	0.37	-0.10	0.04
ITAC	0.02	0.00	0.00	0.80
Lagged Test Score	0.23	0.00	-0.12	0.00
Constant	-0.18	0.00	-0.08	0.06
R^2	0.78		0.19	

Year dummies included in model but not shown on table

DV is % of students in school meeting or exceeding standards on state tests



Improving ITAC has some impact at both school levels in Chicago

School-Level Fixed Effects, Chicago

Predictors	Elementary/Middle		High School	
	<i>Stand. Coeff.</i>	<i>Sig.</i>	<i>Stand. Coeff.</i>	<i>Sig.</i>
% Inexperienced	-0.02	0.06	-0.02	0.53
% Minority	-0.07	0.48	-0.38	0.13
% FRL	-0.05	0.26	-0.14	0.11
ITAC	0.02	0.08	0.06	0.08
Lagged Test Score	0.34	0.00	0.26	0.00
Constant	-0.85	0.00	-0.38	0.32
R^2	0.80		0.93	

Year dummies included in model but not shown on table



Summary

- Bad news: There are quite large ITAC gaps by school level, school poverty and minority concentrations, and between Chicago and other regions and locales.
- Good news: ITAC gaps have shrunk considerably over the past six years, and recent data about new teachers, especially in Chicago, indicates that this trend is likely to continue.
- ITAC has a small independent effect on student achievement – reason to believe that improving ITAC would improve achievement.



Discussion

- New teacher ITAC is improving considerably, especially in Chicago and other urban areas – to what extent did HQT provisions of NCLB and new basic skills test policies in Illinois contribute to this?
 - Others find similar trends elsewhere with regard to improvements in new teacher academic capital elsewhere.
 - If inexperienced teachers bring with them increasingly stronger academic capital (especially to more needy schools), should we worry if some schools have more inexperienced teachers than others?
- School-level achievement measures are only a rough approximation of performance, so it is difficult to be conclusive about the role of ITAC (or any other measures) in school improvement.
 - But Boyd et al (2007) were able to use student value-added data and found a direct link between teacher academic capital and student progress.



More Discussion

- Teacher academic capital is not a silver bullet and it is just one of many aspects of teacher quality – but it does mean something.
 - The evidence that ITAC is improving in our neediest schools is significant and gives rise to justified optimism
 - However, in order to make the kind of impact that is needed across the board, ITAC changes may need to be quite large.
- It is possible to improve teacher academic capital, and some schools – especially those in Chicago – have made great strides in a short time.
 - The challenge is to continue to close these ITAC gaps, continue to improve new teacher academic capital, and to ensure that all schools provide working conditions suitable to the retention of successful teachers.



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