The Distribution and Impact of Teacher Quality in Illinois

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Measurable Teacher Quality Attributes Linked to Student Achievement

• Selectivity of teacher’s baccalaureate college

• Years of teaching experience

• Advanced subject-specific degrees
  - *high school math and science*

• Subject-specific teacher certification
  - *strongest for high school math*

• Teacher test scores
  - *particularly for at-risk students*
### Teacher Quality Index (TQI)

#### School Level Teacher Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teachers’ Average ACT Composite Scores</td>
<td>0.861</td>
</tr>
<tr>
<td>Teachers’ Average ACT English Scores</td>
<td>0.859</td>
</tr>
<tr>
<td>% of Teachers who Failed Basic Skills Test on First Attempt</td>
<td>-0.691</td>
</tr>
<tr>
<td>% of Teachers with Emergency/Provisional Certification</td>
<td>-0.577</td>
</tr>
<tr>
<td>Teachers’ Average College Competitiveness Ranking</td>
<td>0.520</td>
</tr>
<tr>
<td>% of Teachers with less than 4 Years of Experience</td>
<td>-0.044</td>
</tr>
</tbody>
</table>

- *The TQI was standardized to have a statewide mean of 0.0 and a standard deviation of 1.0*
## Average School-Level Teacher Attributes by Approximate TQI Score

<table>
<thead>
<tr>
<th>TQI Component</th>
<th>TQI ≧ -2.0</th>
<th>TQI ≧ 0.0</th>
<th>TQI ≧ 2.0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teachers’ Average ACT Composite Score</td>
<td>18.1</td>
<td>20.8</td>
<td>24.8</td>
</tr>
<tr>
<td>Teachers’ Average ACT English Score</td>
<td>18.4</td>
<td>21.4</td>
<td>25.3</td>
</tr>
<tr>
<td>% of Teachers who failed Basic Skills test on first attempt</td>
<td>14%</td>
<td>2%</td>
<td>0%</td>
</tr>
<tr>
<td>% of Teachers with Emergency/Provisional Certification</td>
<td>8%</td>
<td>1%</td>
<td>0%</td>
</tr>
<tr>
<td>Teachers’ Average College Competitiveness Ranking</td>
<td>2.8</td>
<td>3.0</td>
<td>3.7</td>
</tr>
<tr>
<td>% of Teachers with &lt; 4 Years of Experience</td>
<td>17%</td>
<td>18%</td>
<td>15%</td>
</tr>
</tbody>
</table>
Data and Methods

• **2002-2003 Data for ~140,000 Illinois Teachers**
  - Illinois Teacher Service Records
  - Illinois Teacher Certification Information System
  - ACT, Inc.
  - Barron’s Guide
  - Common Core of Data (NCES)
  - Illinois School Report Cards

• **Distribution of School-level TQI by:**
  - seven geographic regions in Illinois
  - school type
    - locale (urban, suburban, town, rural)
    - % low-income students
    - % minority (non-white) students
Distribution of TQI by Region

Teacher Quality Index

School Percentile:  
- 90th (High)
- 50th (Middle)
- 10th (Low)
Distribution of TQI by Region and Percent Minority Students
Distribution of TQI by Region and Percent Low-Income Students
School TQI Variance Decomposition

- Between Regions: 54%
- Between Districts within Regions: 39%
- Between Schools within Districts: 7%
Summary So Far

- Teacher Quality is distributed unequally across and within regions in Illinois.

- Even within school type, there is variation in teacher quality attributes across schools.

- Low-income schools and high-minority schools tend to be more disadvantaged in terms of average teacher quality than high-income and low-minority schools.

- Districts play an important role in the distribution of teacher quality.
Using the TQI

- Working with the Education Trust, the Joyce Foundation, and others on a 3-state project
  - Focus on policy perspective and equity & access issues

- Communicating results to a lay audience
  - Dividing TQI into quartiles (+ bottom 10%)
  - Using constant poverty and minority categories
We divided all schools in the state into four statewide quartiles, based on their TQI. The quartiles (and lowest 10%) are shown in the four colors in the graph.

### Average TQI by Quartile

<table>
<thead>
<tr>
<th>Quartile</th>
<th>TQI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lowest 0-10%</td>
<td>-2.1</td>
</tr>
<tr>
<td>11-25%</td>
<td>-0.8</td>
</tr>
<tr>
<td>Upper Middle</td>
<td>-0.1</td>
</tr>
<tr>
<td>Highest</td>
<td>0.4</td>
</tr>
<tr>
<td></td>
<td>1.1</td>
</tr>
</tbody>
</table>
Distribution of School TQI by School Percent Poverty

- **TQI distribution is strongly related to school poverty levels** ($r = -.63$).
- **The differences continue across all poverty groupings.**
Distribution of School TQI by School Percent Minority

- **TQI distribution is strongly related to school minority levels** ($r=-.58$).
- **Little difference below about 50% minority**
Distribution of School TQI by Locale

- **Chicago** – with its high concentration of poor and minority students – is very different from other urban areas.
# Regression Model

**% Meeting or Exceeding State Standards**

<table>
<thead>
<tr>
<th></th>
<th>Elem</th>
<th>Elem/Mid</th>
<th>Mid</th>
<th>HS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>83.6</td>
<td>82.5</td>
<td>77.7</td>
<td>60.3</td>
</tr>
<tr>
<td>TQI</td>
<td>1.3</td>
<td>1.9</td>
<td>2.9</td>
<td>5.9</td>
</tr>
<tr>
<td>10% Minority</td>
<td>-1.3</td>
<td>-1.0</td>
<td>-0.5</td>
<td>-0.6</td>
</tr>
<tr>
<td>10% FRL</td>
<td>-3.3</td>
<td>-3.8</td>
<td>-4.1</td>
<td>-3.8</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>.68</td>
<td>.76</td>
<td>.72</td>
<td>.70</td>
</tr>
<tr>
<td>N</td>
<td>1321</td>
<td>1357</td>
<td>499</td>
<td>580</td>
</tr>
</tbody>
</table>

All values significant at $p < .01$
School Performance by TQI

- TQI appears to matter more for high-poverty/high-minority schools and for high schools.
Summary of Findings

• The distribution of teacher quality is strongly related to school poverty and minority levels, regardless of the region of the school.

• Students in the highest-poverty and highest-minority schools typically face qualitatively different teachers than students in other schools.

• TQI appears to have an independent effect on school achievement, especially in the upper grades.
Implications

• Interventions need to be targeted towards high-needs schools to make them more attractive places to work.
  – Salary
  – Working conditions

• Human resource policies and practices (hiring, firing, placement, and transfer) should consider the distribution of teacher quality.

• Improvements in overall teacher quality are needed to ensure that all students have access to high quality teachers.
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