Does Intensive Mentoring Improve Teaching?
Results from a Randomized Experiment

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Center for Education Policy Analysis, Stanford University

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The New Teacher Problem

- High Turnover
  - Costly to replace
  - Disruptive to school

- Inexperience and Productivity
  - Inadequate preparation
  - Need OJT?

Policy Response?
“Comprehensive Teacher Induction”
What Is Comprehensive Induction?

- **Mentors**
  - Carefully selected and trained
  - Full-time mentors with 12:1 ratio

- **Curriculum**
  - Instructionally focused
  - Structured and sequenced

- **Activities**
  - Weekly meetings with mentor
  - Monthly professional development sessions
  - Classroom observation with formative assessment
  - End-of-the-year colloquium
  - Outreach to district and school administrators
Compared to prevailing induction support, what is the impact of comprehensive induction on…

1. Induction services?
2. Workforce outcomes?
3. Classroom outcomes?
Study Design

- Selected 17 districts
  - Large (urban), high poverty
  - No current comprehensive induction program
- Randomized 418 elementary schools
- Followed 1,009 teachers
  - 698 eligible for classroom observation in year 1
  - 190 eligible for test-score analysis in year 3
- In year 2, created two experiments
  - “One-year districts”: one-year induction program
  - “Two-year districts”: two-year induction program
Data

- Mentor survey at baseline
- Six teacher surveys over four years
  - Background information (at baseline)
  - Induction activities
  - Attitudes (satisfaction, preparedness)
  - Mobility outcomes
- Classroom observations during year 1
- District-administered student test scores after each of the first three years
Summary of Findings

- **Induction services**
  - Control group received induction services
  - Treatment group received more induction during intervention period

- **Workforce outcomes**
  - No impact on attitudes
  - No impact on teacher retention, mobility

- **Classroom outcomes**
  - No impacts on classroom practices in the first year
  - No impacts on test scores in one-year districts
  - Positive impacts on test scores in two-year districts
    - Years 1 and 2: no impacts
    - Year 3: effect size = 0.11 (reading) and 0.20 (math)
    - Positive impacts are sensitive to sample definition
Induction Support
Time Spent with Mentors: One-Year Districts

Solid square = Treatment-control difference is significantly different from zero at the 0.05 level (n = 398 to 503 teachers).
Time Spent with Mentors: One-Year Districts

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Percentage With a Mentor Assigned: One-Year Districts

Solid square = Treatment-control difference is significantly different from zero at the 0.05 level (n = 358 to 503 teachers).
## Percentage Receiving Assistance in Year 1: One-Year Districts

<table>
<thead>
<tr>
<th>Type of Assistance</th>
<th>Treatment</th>
<th>Control</th>
<th>Impact</th>
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</thead>
<tbody>
<tr>
<td>Suggestions to improve practice</td>
<td>77</td>
<td>53</td>
<td>24*</td>
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<tr>
<td>Encouragement/moral support</td>
<td>87</td>
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<td>Opportunity to raise concerns</td>
<td>76</td>
<td>65</td>
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<tr>
<td>Help with administrative issues</td>
<td>67</td>
<td>53</td>
<td>14*</td>
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<tr>
<td>Help with state/district standards</td>
<td>61</td>
<td>44</td>
<td>17*</td>
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<tr>
<td>Help identifying teaching challenges</td>
<td>82</td>
<td>55</td>
<td>27*</td>
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<tr>
<td>Instructional goals</td>
<td>73</td>
<td>48</td>
<td>25*</td>
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<tr>
<td>Advice on how to assess students</td>
<td>58</td>
<td>44</td>
<td>14*</td>
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<tr>
<td>Shared lesson plans</td>
<td>56</td>
<td>48</td>
<td>8</td>
</tr>
<tr>
<td>Acted on a request from beg. teacher</td>
<td>72</td>
<td>51</td>
<td>21*</td>
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* Treatment-control difference is significantly different from zero at the 0.05 level (n = 503 teachers).
## Percentage Receiving Assistance in Year 2: One-Year Districts

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<td>Help with administrative issues</td>
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<td>Help with state/district standards</td>
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<td>Help identifying teaching challenges</td>
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* Treatment-control difference is significantly different from zero at the 0.05 level (n = 472 teachers).
Time Spent with Mentors: Two-Year Districts

Minutes/week

Control

Fall 05  Spring 06  Fall 06  Spring 07  Fall 07  Fall 08

81  82  48  41  15  18

Solid square = Treatment-control difference is significantly different from zero at the 0.05 level (n = 321 to 395 teachers).
Time Spent with Mentors: Two-Year Districts

Minutes/week

Control

Solid square = Treatment-control difference is significantly different from zero at the 0.05 level (n = 321 to 395 teachers).
Time Spent with Mentors: Two-Year Districts

Minutes/week

<table>
<thead>
<tr>
<th>Fall 05</th>
<th>Spring 06</th>
<th>Fall 06</th>
<th>Spring 07</th>
<th>Fall 07</th>
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<td>81</td>
<td>79</td>
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<td>12</td>
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<td>11</td>
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Solid square = Treatment-control difference is significantly different from zero at the 0.05 level (n = 321 to 395 teachers).
Percentage with a Mentor Assigned: Two-Year Districts

Solid square = Treatment-control difference is significantly different from zero at the 0.05 level (n = 321 to 395 teachers).
## Percentage Receiving Assistance in Year 1: Two-Year Districts

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<td>Opportunity to raise concerns</td>
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<td>Help with administrative issues</td>
<td>74</td>
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<tr>
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<td>70</td>
<td>54</td>
<td>16*</td>
</tr>
<tr>
<td>Acted on a request from beg. teacher</td>
<td>78</td>
<td>50</td>
<td>28*</td>
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* Treatment-control difference is significantly different from zero at the 0.05 level $(n = 395$ teachers).
## Percentage Receiving Assistance in Year 2: Two-Year Districts

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<td>30</td>
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<td>37*</td>
</tr>
</tbody>
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* Treatment-control difference is significantly different from zero at the 0.05 level (n = 360 teachers).
Impacts on the Workforce: Teacher Attitudes
Teacher Satisfaction with School: Two-Year Districts

Treatment-control differences are not significantly different from zero at the 0.05 level (n = 318 to 391 teachers).
Teacher Preparedness to Instruct: Two-Year Districts

Treatment-control differences are not significantly different from zero at the 0.05 level (n = 308 to 394 teachers).
No Impacts on Teacher Attitudes

- No significant impacts on satisfaction with—
  - Career
  - School
  - Class

- No significant impacts on feelings of preparedness to—
  - Instruct
  - Work with others
  - Work with students
Impacts on the Workforce: Teacher Mobility
Retention in the District: One-Year Districts

Treatment-control differences are not significantly different from zero at the 0.05 level (n = 417 to 561 teachers).
Retention in Teaching: One-Year Districts

Treatment-control differences are not significantly different from zero at the 0.05 level (n = 464 to 561 teachers).
Retention in the District: Two-Year Districts

Treatment-control differences are not significantly different from zero at the 0.05 level (n = 345 to 448 teachers).
Retention in Teaching: Two-Year Districts

Treatment-control differences are not significantly different from zero at the 0.05 level (n = 375 to 448 teachers).
Reasons for Changing Schools

Treatment-control differences are not significantly different from zero at the 0.05 level (n = 227 teachers).

Better opportunities elsewhere: Treatment 14%, Control 10%
Involuntary move: Treatment 16%, Control 14%
Principal's leadership: Treatment 20%, Control 22%
Moved residence: Treatment 22%, Control 28%
Working conditions or compensation: Treatment 28%, Control 25%
Reasons for Leaving Teaching

Treatment

Control

- Better career opportunities elsewhere: 15% (Treatment), 14% (Control)
- Moved or involuntary layoff: 17% (Treatment), 10% (Control)
- Principal's leadership: 17% (Treatment), 26% (Control)
- Other working conditions: 16% (Treatment), 9% (Control)
- Pregnancy/child at home/health: 36% (Treatment), 41% (Control)

Treatment-control differences are not significantly different from zero at the 0.05 level (n = 97 teachers).
Composition Effects: One-Year Districts

Teachers Still in the District in Fall 2008

- Selective college education degree: Treatment 28%, Control 27%
- Master’s or doctorate: Treatment 22%, Control 28%
- Traditional route: Treatment 68%, Control 59%
- Certified: Treatment 95%, Control 95%

Treatment-control differences are not significantly different from zero at the 0.05 level (n = 287 teachers).

SAT Scores

- Treatment: 1040, Control: 1013
Composition Effects: Two-Year Districts

Teachers Still in the District in Fall 2008

Treatment-control differences are not significantly different from zero at the 0.05 level (n = 217 teachers).
No Composition Effects

- Treatment stayers vs. control stayers

Findings
- Professional characteristics of teachers: no difference
- Classroom practices in year 1: no positive impact
- Student achievement in year 3: no positive impact
Impacts on the Classroom:
Teacher Practices
No Impact on Year 1 Classroom Practices

Treatment-control differences are not significantly different from zero (n = 631 teachers).
Impacts on the Classroom: Student Achievement
*Treatment-control difference is significantly different from zero at the 0.05 level (n = 95 to 99 teachers in one-year districts and 68 to 74 teachers in two-year districts).
How Robust Are Year 3 Test Score Findings?

- Different rules for including/excluding teachers
- Different methods for estimating impact
  - Some negative impacts for math in one-year districts
  - No change otherwise
- Addition of “bottom grade” and other students with no pretest
  - All impacts are statistically insignificant
Sample Size for Test Score Analysis: Two-Year Districts

- Ineligible, not in targeted grade/subject: 358
- Potentially eligible: 90
- Dropped: 22
- Analysis Sample: 68
# Sensitivity Tests, Year 3 Impact on Reading in Two-Year Districts

<table>
<thead>
<tr>
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<th>Impact (Effect Size)</th>
<th>Standard Error</th>
<th>Sample Size (Teachers)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Benchmark</td>
<td>0.11*</td>
<td>0.05</td>
<td>74</td>
</tr>
<tr>
<td>2. Drop data restrictions</td>
<td>0.11*</td>
<td>0.05</td>
<td>74</td>
</tr>
<tr>
<td>3. Allow comparisons across grades</td>
<td>0.16*</td>
<td>0.05</td>
<td>82</td>
</tr>
<tr>
<td>4. Drop pretest, benchmark sample</td>
<td>0.05</td>
<td>0.08</td>
<td>74</td>
</tr>
<tr>
<td>5. Drop pretest, expanded sample</td>
<td>-0.07</td>
<td>0.09</td>
<td>127</td>
</tr>
</tbody>
</table>

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# Sensitivity Tests, Year 3 Impact on Math in Two-Year Districts

<table>
<thead>
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</thead>
<tbody>
<tr>
<td>1. Benchmark</td>
<td>0.20*</td>
<td>0.05</td>
<td>68</td>
</tr>
<tr>
<td>2. Drop data restrictions</td>
<td>0.23*</td>
<td>0.05</td>
<td>70</td>
</tr>
<tr>
<td>3. Allow comparisons across grades</td>
<td>0.13*</td>
<td>0.06</td>
<td>77</td>
</tr>
<tr>
<td>4. Drop pretest, benchmark sample</td>
<td>0.15</td>
<td>0.08</td>
<td>68</td>
</tr>
<tr>
<td>5. Drop pretest, expanded sample</td>
<td>-0.03</td>
<td>0.09</td>
<td>120</td>
</tr>
</tbody>
</table>

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Summary of Findings

- **Induction services**
  - Control group received induction services
  - Treatment group received more induction during intervention period

- **Workforce outcomes**
  - No impact on attitudes
  - No impact on teacher retention, mobility

- **Classroom outcomes**
  - No impacts on classroom practices in the first year
  - No impacts on test scores in one-year districts
  - Positive impacts on test scores in two-year districts
    - Years 1 and 2: no impacts
    - Year 3: effect size = 0.11 (reading) and 0.20 (math)
    - Positive impacts are sensitive to sample definition
Questions to Consider

- **Existence of de facto induction**
  - Are veteran teachers helping more than district leaders realize?
  - How well are services coordinated?

- **Quantity and timing of services**
  - Can novice teachers be overloaded?
  - Are services in the second year more beneficial?
For More Information

- Please contact
  - Steve Glazerman
    - sglazerman@mathematica-mpr.com

- Report is available online