EMERGING TRENDS AND RECRUITMENT INITIATIVES OF THE STEM TEACHING WORKFORCE: 
AN ANALYSIS OF TEACHER QUALITY, MOTIVATORS OF ENTRY, AND GENDER EFFECTS

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Education and Social Policy Capstone

Practical significance of STEM teacher quality

- 1983 - A Nation at Risk created a focus on the lack of US student preparedness in math and science. Critics lack of student standards
- 2002 - No Child Left Behind focused on recruiting “highly qualified teachers” to eliminate achievement gaps
- 2009 - The Educate to Innovate Initiative campaign included concerted efforts by Federal Government, corporations, foundations, and non profits
- 2011 - 100k10 aims to dramatically increase the quantity and quality of STEM teachers

Research Hypotheses

1) The increase in STEM education initiatives influenced the composition of the k-12 STEM teaching workforce to include more content-knowledgeable and credentialed professionals over time.
2) Reasons for entering k-12 STEM teaching differ from reasons for entering another profession.
3) Reasons for entering the k-12 STEM teaching profession differ by gender in systematic ways that can be mitigated by targeted policies.

Sample and Measures

- Scientists and Engineers Statistical Data System (SESTAT)
  - Sponsored by the National Science Foundation
  - Nationally represented data of trained and/or employed in science, engineering or related fields
- Sample characteristics:
  - Bachelor’s and Master’s degree recipients from a postsecondary institution within the United States
  - Employed in any sector of the workforce; earned highest degree in any field
  - 222,274 graduate-year observations; 17,434 STEM teachers

Quality Indicators

- Degree Major of Highest Degree (STEM/Non-STEM)
- Degree Level of Highest Degree (Bachelor’s/Master’s)

Influential Factors of Career Change

- Pay or promotion opportunities
- Working conditions
- Job location
- Change in career or professional interests
- Family-related reasons
- Job in one’s highest degree field was not available

Relevant Confounders

- Decade highest degree was received
- Gender
- Having children
- Race/ethnicity
- Age

Conceptual Framework

We aim to identify the effects of degree type and level along with individual attributes and motivation as they relate to policy characteristics over time and gender on the odds of trained scientists and engineers entering the K-12 teaching profession as STEM teachers

Potential Growth in Quality Over Time

Table: ODDS FOR AND AGAINST MALES BECOMING STEM TEACHERS

<table>
<thead>
<tr>
<th>Degree</th>
<th>Male</th>
<th>Female</th>
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<tr>
<td>STEM Major</td>
<td>0.7642**</td>
<td>0.6768***</td>
</tr>
<tr>
<td>Master's Degree</td>
<td>0.3906***</td>
<td>0.3474***</td>
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<tr>
<td>STEM Major × Master's Degree</td>
<td>0.1561**</td>
<td>0.1031**</td>
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<table>
<thead>
<tr>
<th>Decade</th>
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</thead>
<tbody>
<tr>
<td>1950s</td>
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<td>1960s</td>
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<tr>
<td>1990s</td>
<td>0.2126***</td>
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</tbody>
</table>

Discussion of Findings

- Steady growth in the STEM teaching workforce
  - Increasing number of credentialed and content-knowledgeable individuals (as measured in SESTAT)
- Determinants of career change more predictive of not entering STEM teaching
  - Measures more representative of reasons for entering other profession(s), both STEM and non-STEM
  - Reasons for entering STEM teaching not measured
- Male career changers more likely to enter STEM teaching for broader professional reasons
  - Highly qualified males identified as the least likely to become STEM teachers
- Males become STEM teachers because of working conditions, personal circumstance, and if no other suitable job is available

Implications for Future Policy & Recruitment Efforts

- Increased opportunities for promotion and leadership roles
- Intradepartmental team leadership, coaching roles
- Would also address issues of pay and working conditions
- Provide professional support systems (beyond schools)
- Professional development, additional resources, mentorship, etc.

Next Steps

- Examine dynamics of prior occupations among career-changers
- Further research on the odds of becoming STEM teachers across STEM disciplines
- Explore state-, district-, and teacher-level data to identify the impact of state and local policy on the STEM teacher labor force
- Research on retention rates among content-knowledgeable and credentialed STEM teachers

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