Time Spent on Research with Undergraduate Students

Gender Differences among STEM Faculty

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Research Focus

The aim of this study is to explore characteristics that contribute to faculty members spending more time mentoring undergraduate students in research.

With a particular focus on disciplinary fields (STEM) where retention of underrepresented students groups are of a concern.
Review of Literature

- Undergraduate students participating in research tend to have higher intellectual gains, greater retention rates, and stronger mentoring relationships with faculty (e.g. American Council of Learned Societies, 2007; Bauer & Bennett, 2003; Eigren & Hensel, 2006).

- Also it leads to increased job interests in the STEM fields (e.g. Russell, Hancock, & McCullough, 2007).

- Particularly important as a way to sustain and attract minority population which are underrepresented in the STEM fields (e.g. Bauer & Bennett, 2003; Lopatto, 2004).
Guided Research Question

Does a difference exist between the time male and female faculty spend working with students on their research?

If so, does the gap vary by STEM and non-STEM fields?

What other faculty characteristics might explain any differences?
FSSE Instrument

• Online survey

• General topics
  • Faculty perceptions of student engagement
  • Importance or emphasis faculty place on various activities and areas of learning and development
  • Faculty perceptions of the campus environment
  • How faculty members organize class time

• In 2008, over 23,000 faculty from 160 institutions

• Two survey options (course-based & typical student)
Sample characteristics

9,862 faculty members
- 48% Women
- 77% White
- 6% non-U.S. citizens
- 84% Full-time
- 22% Lect/Inst
- 27% Assist, 25% Assoc
- 27% Full Professor

From 112 U.S. Inst
- 36% from research/doc
- 42% from master’s
- 22% from baccalaureate
- 33% from private inst

Discipline
- 34% STEM
- 66% Non-STEM
Analyses

• Hierarchical, OLS regression

• Dependent measure
  • Average hours per week faculty spent working with undergraduates on research

• Independent measures
  • Gender
  • Discipline (STEM and Non-Stem)
  • Other faculty, institutional controls
  • Interaction terms = disciplinary x gender

• Mean and adjusted mean differences reported
## Results

OLS regression of Faculty time per week spent working with undergraduates on research

<table>
<thead>
<tr>
<th>Variance due to:</th>
<th>Time on Undergraduate Research</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty Characteristics</td>
<td>.109***</td>
</tr>
<tr>
<td>Institutional Characteristics</td>
<td>.011***</td>
</tr>
<tr>
<td>Interaction Terms</td>
<td>.001***</td>
</tr>
<tr>
<td>Total Variance Explained</td>
<td>.121***</td>
</tr>
<tr>
<td>Adjusted $R^2$</td>
<td>.119***</td>
</tr>
</tbody>
</table>

***p < .001
Results

Faculty time per week spent working with undergraduates on research by discipline and gender

Mean Differences

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**p < .001**
Results

Faculty time per week spent working with undergraduates on research by discipline and gender

Adjusted Mean Differences

![Graph showing adjusted mean differences in faculty time spent working with undergraduates on research by discipline and gender. The graph indicates a significant difference in time spent between STEM and Non-STEM fields, with a larger gap for female faculty.](image)

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***p < .001, +p<.10
Implications/Conclusions

• Remove any organizational barriers that might keep female STEM faculty from having time to do research with undergraduate research (e.g. the level of courses they teach, course loads)

• Extra support/incentive for faculty who have been teaching in STEM fields for many years to do undergraduate research

• In non-STEM fields make sure participation in undergraduate research is part of promotion and tenure to ensure faculty along all spectrum of faculty rank participate
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