The role of pedagogy courses in graduate students’ socialization as future faculty in STEM disciplines

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Our goals for you in this interactive session

• Recognize the role of faculty mentors in helping graduate students develop research, teaching, and service skills
• Become aware of departmental, campus, and institutional programs and services that support graduate student development
• Encourage you to share these resources with your graduate students and spark your interest in developing new resources

Case study: Multiple roles of faculty mentors

What roles describe your professional relationship with the graduate student or postdoc in this case study (e.g., taskmaster, role model, mediator, cheerleader)?

How would you respond to the graduate student or postdoc in the case study?

Developmental progression of graduate students

<table>
<thead>
<tr>
<th>Aspect</th>
<th>New graduate student</th>
<th>Junior colleague</th>
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</thead>
<tbody>
<tr>
<td>Teaching &amp; research skills</td>
<td>Survival</td>
<td>Developing skills</td>
</tr>
<tr>
<td>Disciplinary language</td>
<td>Simplistic</td>
<td>Insider</td>
</tr>
<tr>
<td>Interpersonal reliance</td>
<td>Dependent</td>
<td>Independent or counter-dependent</td>
</tr>
</tbody>
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(Sprague and Nyquist, 1989, 1991; Nyquist and Wulff, 1996)

Academic institutions want to hire...

...self-starters who hit the ground running and who have realistic expectations about faculty life.

• Have a publishing record
• Have experience teaching own course(s)
• Participate in departmental service activities

(Adams, 2002; Boice, 1991; Bruff, 2007; DeKosky, 2002; Fleit et al., 2000; Kaplan et al., 2007; Meirisil and Kaplan, 2008; Olsen, 1993; Olsen and Crawford, 1998; Smith and Kalicka, 1998)
Most academic search committees expect new hires to have reflected on their teaching

<table>
<thead>
<tr>
<th>Institution type</th>
<th>Doctoral</th>
<th>Master's</th>
<th>Bachelor's</th>
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<tbody>
<tr>
<td>% requesting teaching statement during hiring</td>
<td>54%</td>
<td>62%</td>
<td>62%</td>
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</table>

<table>
<thead>
<tr>
<th>Discipline type</th>
<th>Humanities</th>
<th>Social Sciences</th>
<th>Natural Sciences</th>
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<tbody>
<tr>
<td>% requesting teaching statement during hiring</td>
<td>50%</td>
<td>50%</td>
<td>80%</td>
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(Kaplan et al., 2007)

The effect of teaching enhancement activities on graduate students

<table>
<thead>
<tr>
<th>Program/Activity</th>
<th>Outcomes</th>
<th>References</th>
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<tbody>
<tr>
<td>Teaching orientations</td>
<td>Increased or improved: Student learning</td>
<td>Alston et al., 1999</td>
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<tr>
<td>Classroom observation and feedback</td>
<td>Course ratings</td>
<td>Austin, 2002</td>
</tr>
<tr>
<td>Pedagogy courses</td>
<td>Knowledge about teaching and learning topics</td>
<td>Baumgartner, 2007</td>
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<tr>
<td>Teaching certificates</td>
<td>Attitudes about teaching</td>
<td>Black, 1995</td>
</tr>
<tr>
<td>Preparing future faculty (PFF) programs</td>
<td>Self-confidence</td>
<td>Bonafini, 1995</td>
</tr>
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<td>Self-efficacy</td>
<td>Carroll, 1980</td>
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<td></td>
<td>Attitudes about discipline</td>
<td>DeNeef, 2002</td>
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<td>Self-awareness of career progress</td>
<td>Gaff and Lambert, 1996</td>
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<td></td>
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<td>Gia et al., 2003</td>
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<td></td>
<td></td>
<td>Jerich and Lentieke, 1993</td>
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<td></td>
<td></td>
<td>Kearns et al., in press</td>
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<td></td>
<td></td>
<td>Ness and Wulf, 1996</td>
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<td></td>
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<td>Prieto and Altmaier, 1994</td>
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<td></td>
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<td>Prieto and Meyers, 1999</td>
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<td></td>
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<td>Schneider et al., 2008</td>
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<td></td>
<td></td>
<td>Shannon et al., 1998</td>
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<td></td>
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<td>Taylor et al., 2008</td>
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<td></td>
<td></td>
<td>Tice et al., 1998a,b</td>
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<td></td>
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<td>Williams, 1991</td>
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<td>Wulf et al., 2004</td>
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Pedagogy courses: Developing and reflecting on teaching experience

From excellent to scholarly teachers

- Describe
- Rationalize
- Gather evidence
- Analyze
- Transform

[Hutchings and Shulman, 1999]

http://www.iub.edu/~teaching/allabout/prepare/pedagogy.shtml

Applications

What new ideas have you heard so far?

How would you use these ideas in your mentoring of graduate students and postdocs?

Case Study: Pedagogical Methods in Health Sciences (MSCI M620)

- Student learning styles
- Classroom presentation
- Syllabus construction
- Classroom research
- Scholarship of teaching
- Statement of teaching philosophy
- Teaching portfolio
- Metacognition of teaching

Course taught by M. Braun and V. O'Loughlin

http://medsci.indiana.edu/m620/sotl_08/start.htm

Pedagogy class demographics: Spring 2007

- Ten participants
  - 7 women and 3 men
- Multiple disciplines
  - Biology
  - Medical Sciences
  - HPER
  - Anthropology
- Varied teaching backgrounds
Our Research Questions
As a result of taking the pedagogy course, did our students:

1. Develop a more complex attitude regarding student learning?
2. Question and evaluate their current teaching methods?
3. Explore methods of evaluating their own classroom teaching strategies?
4. Envision themselves becoming involved in a public teaching resource network?

And were these attitudes and skills long-lasting and continuing to develop months AFTER the COURSE?

Sources of Data

• Course & instructor evaluations
• Pre and post course surveys of student attitudes
• Quantitative & qualitative analysis of class assignments
  – Statement of teaching philosophy
  – Teaching portfolio
• Six month follow-up interview
• Participation in activities outside of the classroom

Mentoring process for composing teaching philosophy statements

• In-class workshops
• Writing guides
• Exercises
• Peer feedback
• One-on-one consultation
• Revision
• Instructor feedback

Qualitative and quantitative comparison of draft & final teaching statements

Final teaching statements:

• Were more descriptive and had better narrative flow
• Included instructor goals and motivations
• Were more student-centered

Students improved in their ability to:

• Describe their teaching
• Explain their learning goals and assessments
• Engage the reader with an organizing thesis

Our students incorporated aspects of successful teaching statements (Kaplan et al., 2007)

Positive outcomes of the pedagogy course

Students said they enhanced their teaching skills:

• Developed increased confidence in the classroom
• Gained a deeper understanding of their students
• Examined how to evaluate student learning
• Evaluated their own teaching effectiveness
• Discovered an array of teaching techniques and styles

Positive outcomes of the pedagogy course

Students said they progressed as teacher-scholars:

• Engaged in a forum to discuss their teaching
• Received collaboration, communication, feedback re: teaching statements and teaching portfolios
  – Produced quality products well before the job search, instead of rushed products during the search
• Developed an interest in pedagogical research
• Learned how to multi-task with respect to teaching, research, and service
Disconnects to teacher-scholar development

Our students said they:

- Struggled with how to measure and document teaching effectiveness
- Lacked documentation from past TA experiences for use in their portfolios
- Had difficulty justifying time spent on teaching improvement with the competing demands of coursework and research

[Miller, O'Loughlin, Kearns et al., in review]

What does our research contribute to our understanding of graduate student development?

- Studied graduate students from multiple disciplines
- Incorporated evidence beyond participant satisfaction surveys
- Investigated both short term and lasting effects of TA training
- Responded to the call for more empirical, data-driven research
- Discovered that graduate students want to be knowledgeable about all aspects of faculty development, but feel conflicted if their focus is not solely on research

*Jabbott et al., 1989*

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“Systematic preparation that acknowledges the holism of graduate student development”

Encourage graduate students to:

- Organize forums to talk about teaching
- Teach their own classes or to deliver selected lectures within a larger class
- Establish relationships with teaching mentors
- Document teaching assessments and innovations in a teaching portfolio
- Reflect on teaching successes and challenges in a statement of teaching philosophy
- Analyze teaching with a rigorous investigative process and an understanding of the relevant literature

Campus and institutional resources to support graduate student teaching development

- http://aiprep.indiana.edu
- Teaching and Learning Gateway http://learning.iub.edu

CIRTL Forum 2008 Resources

http://cirtl.net/Forum2008/index.html

http://www.hhmi.org/resources/labmanagement/
Think-Pair-Share: Identifying existing resources

What activities in your program support your graduate students’ and postdocs’ progression into junior colleagues as teachers and researchers?

Minute Paper: Self-reflection and application

How will your mentoring of graduate students and postdocs be different as a result of attending this event?

What we hope you have gained

• A greater understanding of the research, teaching, and service skills graduate students must develop to become successful future faculty

• An awareness of departmental, campus, and institutional programs and services that support graduate student development

• A motivation to share these resources with your graduate students and an interest in developing new resources