The Longitudinal Study of Future STEM Scholars

Examining the Impact of Graduate Teaching Development Programs on Academic Careers

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Background

One of every three STEM Ph.D.s will be teaching in a college or university within six years of completing their doctorate.

Preparing these future faculty to be effective undergraduate educators has become a higher priority in the national STEM agenda.

Overview of the Study

This study is exploring the short- and long-term impact of **teaching-focused professional development** on STEM doctoral students who intend to become postsecondary faculty and staff.

By definition, **teaching development programs** (trainings, seminars, courses, workshops) aim to help graduate students gain knowledge and skills needed to be effective college teachers.

Research Question

How does participation in teaching-focused professional development affect STEM doctoral students' teaching preparation, teaching self-confidence, career pathways, and early-career performance?

Method

We are using surveys and interviews to follow a panel of 3,060 late-stage doctoral students, from three research universities, for six years (2008-2014). Participating institutions include:

- **Arizona State University**
- **University of Washington-Seattle**
- **University of Wisconsin-Madison**

Data Sources

2008: Located over 70 TD offerings at 3 institutions

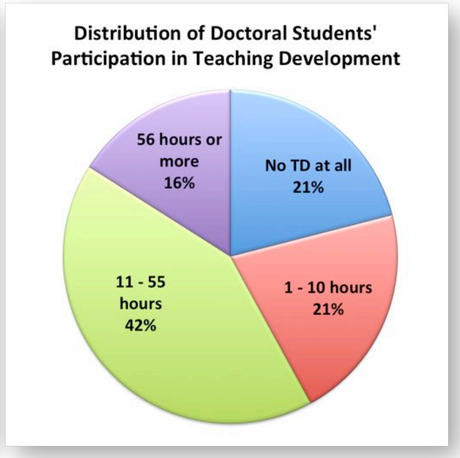
2009: Year One Survey (N = 2,163, 73% response)

2010-11: Year Two Interviews with 76 early-career academics

2011: Year Three Survey (N = 1,445, 67% response)

Who Participated and How Much

- Although 52% of participants were male, **women were more likely to participate than men**.
- The majority of participants were in biological sciences (28%), physical sciences (19%), social sciences (14%), and engineering (11%).
- Although participation was required for many students (73%), many participated in TD to learn more about teaching and learning (58%), to prepare for a career as a faculty member (40%), and to gain practical teaching experience (29%).



PARTICIPANT QUOTE:

"I had no experience teaching, nor did I have any idea how to do it. And [now], I think I'm pretty decent at it. I don't think I would be if I didn't have that sort of [TD] experience or the collaborations and discussions with these people."

Female mathematician, now adjunct faculty

Outcomes of Participation

- Doctoral students who participated in teaching development activities **gained and thereafter applied knowledge and skills known to improve student learning**—namely, teaching approaches that foster greater student engagement; frequent formative assessment; and course design that starts with learning goals.
- New Ph.D.'s reported that their teaching development experiences allowed them **to clarify their career options and successfully compete** for a wider variety of academic jobs.
- Teaching development helped **early-career academics hit the ground running** in their new jobs—both as teachers and researchers—and contributed significantly to their early-career success.

PARTICIPANT QUOTE:

"There is this gap between graduate teaching experiences and what you're expected to do as a young faculty member–which is to actually run the course, build a syllabus, come up with lectures, you know? And there's very little training for that in your graduate teaching experience."

Male biologist, now assistant professor

Employment of Doctorate Recipients

How many doctoral students from our initial 2009 survey had completed their degree by 2011?

- 68% graduated from a Ph.D. program.
- 30% were still enrolled in a Ph.D. program.
- 2% were no longer pursuing a Ph.D.

Of those who completed their PhD, where were they working in 2011?

			Amount of Teaching Development*			
		Total	None	Low	Mod.	High
Employment Status	***n***	**%**	(pct. of total)			
Employed full-time	758	88%	21%	21%	41%	16%
Employed part-time	59	6%	10%	22%	51%	17%
Not employed—still seeking employment	33	4%	9%	24%	42%	24%
Not currently seeking employment	16	2%	25%	31%	38%	6%
	866	100%				
Employment Sector			(pct. of total)			
Postsecondary education	557	68%	19%	20%	43%	18%
Non-academic (business, govt.)	258	32%	27%	21%	40%	12%
	815	100%				
Types of Academic Employers			(pct. of total)			
Doctorate-granting university	377	68%	20%	17%	45%	18%
University-affiliated research institute/med ctr	100	18%	20%	26%	37%	17%
Baccalaureate college	46	8%	4%	30%	43%	22%
Master's-granting college or university	17	3%	24%	18%	41%	18%
Community college or tech institute	17	3%	6%	35%	24%	35%
	557	100%				
Job Titles			(pct. of total)			
Postdoctoral scholar, fellow, or associate	422	51%	20%	21%	41%	18%
Staff researcher	137	17%	25%	18%	42%	15%
Tenure-track faculty	106	13%	15%	25%	42%	19%
Non-tenure-track faculty	57	7%	9%	19%	56%	16%
Engineer	57	7%	40%	21%	32%	7%
Administrator	20	3%	10%	30%	30%	30%
Other job title	66	8%	23%	23%	41%	14%
	814	100%				

** Low engagement = 1-10 hours; moderate = 11-55 hours; high = >55 hours.*

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