

Variation in PhD Productivity and Diversity at Top US Chemistry Departments: Looking Closely at the Data

It is no secret that many PhD programs struggle to recruit and retain through graduation women and underrepresented minorities through graduation. AWIS invited long-time member Dr. Sandra L. Laursen and her colleague Dr. Timothy J. Weston, to share the finding of their recently published paper, *Trends in PhD*

Productivity and Diversity in Top-50 US Chemistry Departments: An Institutional Analysis.

The study describes trends in the production and diversity of chemistry PhD degrees in the top-50 US PhD-granting departments in the past two decades. The results highlight departments that stand out from their peers in educating diverse groups of PhD chemists.

What is perhaps most innovative about this study is that it links national data to the top departments in the field. In doing so, it invites a closer examination of the strategies for success that are deployed by specific departments.

During their AWIS Webinar presentation, Drs. Laursen and Weston responded to specific questions, from AWIS members, about their study. Here are a few examples:

AWIS: While your research focuses on chemistry departments, could the research methods be used to examine other fields?

Drs. Laursen & Weston : Yes, the study used publically available data from the US Department of Education Integrated Post-secondary Educational Data System (IPEDS) and the National Science Foundation Survey of Earned Doctorates (SED). These same data sets could be used to replicate the study in any field and for any set of institutions. As always seems to be the case, the data sets did require some work but anyone can access them.

The proportion of women earning PhDs in chemistry is increasing nationally but that increase is not spread evenly across the top fifty chemistry programs.

Top 8	Average 2005-2009	Growth 1987-2009	Bottom 8	Average 2005-2009	Growth 1987-2009
Louisiana State University	49%	23%	Harvard University	20%	7%
University of Washington	47%	30%	University of Chicago	24%	5%
Michigan State University	47%	29%	Columbia University	27%	9%
University of Florida	45%	27%	Colorado State University	28%	6%
Emory University	44%	10%	Ohio State University	28%	12%
Georgia Institute of Technology	41%	20%	Washington University - St Louis	28%	-3%
Purdue University	40%	15%	University of California at Santa Barbara	30%	3%
University of North Carolina at Chapel Hill	40%	11%	Iowa State University	30%	8%

Source: *Trends in PhD Productivity and Diversity in Top-50 U.S. Chemistry Departments: An Institutional Analysis* Sandra L. Laursen and Timothy J. Weston. *J. Chem. Educ.*, Article ASAP, June 3, 2014.

AWIS: Does the study offer insights into the relationships between enrollment, retention, and graduation of women and underrepresented minorities?

Drs. Laursen & Weston: This study did not include a connection to enrollment data. At present, data on graduate admissions and persistence are neither widely available nor standardized in form, thus limiting the potential to build a more complete quantitative model that might distinguish program-level success in admissions from success in retention.

AWIS: Did you find there was a specific approach or particular person that drove the success of the more productive institutions?

Drs. Laursen & Weston: The IPEDS and SED data do not explain the reasons for the observed trends. To gain some insight into the reasons for the success some departments were experiencing, the researchers conducted a limited number of interviews with department chairs and graduate program directors. Some described active and intentional efforts to increase diversity in their departments, while others did not see this issue as high on their priority list. Many departments perceived themselves as average in their representation of women, when in fact some of these departments were not keeping pace with national trends.

Departments with strong records of women's or minority representation were able to cite specific departmental data and specific actions taken to monitor it. This observation suggests that awareness of the data may be an important first step to progress.

The more productive departments did have strong leaders, but also reported that diversity efforts had become part of the departmental culture and were no longer dependent upon single individual.

AWIS: We often talk about the value of a critical mass of women students and/or faculty as an important variable contributing to the success of graduate students. Did the study affirm this idea?

Drs. Laursen & Weston: The study found no significant statistical relationship between the % of PhDs awarded to women and the % of women faculty in the departments studied. This is not what was expected given the studies that have detected such a relationship at the undergraduate level. It is possible that given the low number of women faculty in the top fifty chemistry departments that a critical mass wasn't present to allow detection of a relationship.

In the coming AWIS Webinars will continue to bring you opportunities to think and reflect deeply on professional skill development and advocacy for institutional and organizational transformation. The calendar of future events is listed on the AWIS Website. In addition, on-demand recordings of past webinars are also available of the AWIS Website – see the Research and