STEM Topic: Undergraduate Involvement in Faculty Research

Eagan, M.K., Sharkness, J., Hurtado, S., Mosqueda, C.M., Chang, M.J. 2010. Engaging undergraduates in science research: Not just about faculty willingness. http://heri.ucla.edu/PDFs/pubs/journals/EngagingUndergraduatesinScienceResearchNotJustAboutFacultyWillingness.pdf

> Despite the many benefits of involving undergraduates in research and the growing number of undergraduate research programs, few scholars have investigated the factors that affect faculty members' decisions to involve undergraduates in their research projects. We investigated the individual factors and institutional contexts that predict faculty members' likelihood of engaging undergraduates in their research project(s). Using data from the Higher Education Research Institute's 2007–2008 Faculty Survey, we employ hierarchical generalized linear modeling to analyze data from 4,832 science, technology, engineering, and mathematics (STEM) faculty across 194 institutions to examine how organizational citizenship behavior theory and social exchange theory relate to mentoring students in research. Key findings show that faculty who work in the life sciences and those who receive government funding for their research are more likely to involve undergraduates in their research project(s). In addition, faculty at liberal arts or historically Black colleges are significantly more likely to involve undergraduate students in research. Implications for advancing undergraduate research opportunities are discussed.

Connolly, M.R., Bouwma-Gearhart, J.L., Clifford, M.A. 2007. The birth of a notion: The windfalls and pitfalls of tailoring an SoTL-like concept to scientist, mathematicians, and engineers.

> Despite calls for greater agreement in defining the Scholarship of Teaching and Learning (SoTL), terms that resemble SoTL are proliferating. An NSF-sponsored center for teaching and learning coined its own term, teaching-as-research (TAR), believing it would resonate better with research-active scientists, engineers, and mathematicians. To understand whether this was a wise strategy, we interviewed 43 participants from courses that sought to explain and demonstrate TAR. Our study found that participants defined TAR with varying complexity and that disciplinary concepts generally provided "conceptual handles" for making sense of TAR. However, tailoring a term to particular disciplines entails several challenging tradeoffs.

Shavelson, R.J., Towne, L. Editors, National Research Council. 2002. Scientific research in education. Free Executive Summary. http://www.nap.edu/catalog/10236.html.

> There is long-standing debate among scholars, policy makers, and others about the nature and value of scientific research in education and the extent to which it has produced the kind of cumulative knowledge expected of scientific endeavors. Most recently, this skepticism led to proposed legislation that defines what constitutes rigorous scientific methods for conducting education research.
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> That proposal, coupled with rising enthusiasm for evidence-based education policy and practice, led to this National Research Council study to examine and clarify the nature of scientific inquiry in education and how the federal government can best foster and support it. Specifically, the charge to the committee was to ". . . review and synthesize recent literature on the science and practice of scientific educational research and consider how to support high quality science in a federal education research agency." We did not attempt to evaluate the quality of bodies of

existing research, of existing researchers in the field, or of the existing federal research function because that would have constituted a monumental challenge and we judged it to be beyond the scope of our charge. Instead, we adopted a forward-looking approach that draws on lessons from history and identifies the roles of various stakeholders (e.g., researchers, policy makers, practitioners) in fulfilling a vision for the future of education research.