

Understanding Knowledge Brokers' Assessment of Information in Scientific Repositories

In this Early Career Development Project, Dr. Jodi Schneider, School of Information Sciences (iSchool), University of Illinois, Urbana-Champaign (UIUC), requests \$380,393 without cost sharing from the Laura Bush 21st Century Librarian Program for a 3-year empirical investigation into how knowledge brokers such as journalists, Wikipedia editors, activists, and patient advocates assess the quality of scientific information.

Statement of Broad Need:

Libraries have a key role in helping citizens find sources of trusted information. Yet socioeconomic disparities limit access to the best available scientific information. Citizens' understanding of science is mediated by knowledge brokers including journalists, Wikipedia editors, and activists. The proposed research seeks to clarify how knowledge brokers assess quality of scientific information and the implications for public access, information literacy, and understanding of science on policy-relevant topics such as COVID-19, artificial intelligence, and climate. Libraries serve as a gateway to scientific information for citizens and knowledge brokers by subscribing to scientific digital libraries and databases; maintaining institutional repositories of locally produced scientific products; and helping users interpret and access new forms of scholarly products such as preprints, scientific data, and code. This work advances my long-term research, which analyzes persistent controversies applying science to public policy; how knowledge brokers influence citizens; and whether controversies are sustained by citizens' disparate interpretations of scientific evidence and its quality.

Project Design:

The PI, assisted by two graduate research assistants (GRAs)—one PhD student and one MSLIS student—will develop a conceptual framework for information quality evaluation in scientific digital libraries. To do so, the PI and GRAs will seek to answer three research questions: (1) How do knowledge brokers assess the quality and utility of data and documents in scientific repositories?; (2) Which features impact knowledge brokers' quality and utility evaluations of data and documents in scientific repositories? *For example: type (data vs. document), open access status or full-text availability, data availability, publication venue, index terms, and publication status (preprint, published, post-publication correction, retraction)*; (3) What conceptual model describes knowledge brokers' sensemaking and use of data and documents in scientific repositories?

The PI and GRAs will address these questions through a series of three case studies, one per year, and by iteratively synthesizing findings from each case study. Each case study will center around public communication of scientific information. While topics will be chosen based on recent events, currently the case studies are planned as: Year 1: public health and public policy decision-making around the COVID-19 pandemic; Year 2: artificial intelligence and the future of human labor; Year 3: climate change and its mitigation. For each case study, the PI and GRAs will (1) collect and analyze a purposive sample of about 250 public-facing documents and multimedia—news, Wikipedia pages, forum posts, documentaries, data visualizations—that report, quote, or analyze scientific products and (2) conduct and analyze 25 semi-structured interviews with document authors and librarians and repository managers under IRB-approval using the critical incident technique ([Urquhart et al. 2003](#)) to focus on a recent instance of brokering scientific information to the public. GRAs will code themes ([Braun & Clark 2006](#)) from interview transcript data using Atlas.ti. The resulting model that we develop could describe dimensions of information activities, aspects of the process, and situations in which information is used ([Thivant 2005](#); [Widén-Wulff et al. 2008](#); [Zhang & Soergel 2016](#)).

Diversity Plan:

This research directly impacts diversity, equity, and inclusion by improving access to quality information for all. The PI has a demonstrated personal commitment to increase research participation of women, students from low-income families, and other underrepresented students across intersections of gender, class, race, and

disability, drawing on her background as a first-generation college student. This project will also involve 1 PhD and 1 MSLIS student in the PI's Information Quality Laboratory, who will be mentored in qualitative methods, document analysis, use of technology in information sciences research, and the research field of scholarly communication. To increase the diversity of the pool of potential GRAs, this fall the PI will advertise the iSchool PhD program to Historically Black Colleges and Universities, Hispanic-serving institutions, ALA Spectrum Scholarship recipients, and via the Coalition for Diversity and Inclusion in Scholarly Communications.

Broad Impact:

The conceptual model will be useful in practice for information literacy instruction in knowledge brokerage related fields including media, journalism, and science communication; for libraries and publishers to improve scientific repositories; and for partnerships with university researchers and publicity offices to improve accessibility of scientific products to knowledge brokers. The project aligns with IMLS strategic plan Goal 1: Promote Lifelong Learning by investigating how to improve citizens' access to scientific information via knowledge brokers. Within the library profession, this project will raise awareness about knowledge brokers and their role in information dissemination. The project's advisory board will consist of a communications librarian, a data repository manager, a publisher, an institutional research system manager, a Wikipedian, and a university publicity officer, in order to ensure relevance for these groups. To reach practitioners, the PI and GRAs will present preliminary results at conferences for practitioners (e.g. Digital Library Federation Forum, Open Repositories); in the PI's blog which is aggregated on Planet Code4Lib; and in an annual public webinar coordinated with organizations such as the ACRL-STS, the RDAP Association, and the Wikimedia Foundation. The PI and GRAs will present in research venues (e.g., ASIS&T, iConference, ACM/IEEE Joint Conference on Digital Libraries) and publish scholarly publications (e.g., JASIST, Journal of Documentation). An open access version of publications, data, and models will be made available on the PI's public website and via UIUC's IDEALS repository. The project's approach has applicability to the design of repositories, databases, and digital libraries, and will inform future research on public access, information literacy, and understanding of science.

Budget Summary:

The estimated 3-year project budget is \$380,393, including course buyout support for the project director for 3 years (\$30,000) and summer support of a quarter month for 3 years (\$7,922); 50% PhD stipend and MS hourly wages (\$105,124); personnel benefits (\$27,884); travel (\$16,100); other costs, including transcription services, advisory board stipends, open access publishing costs, and tuition remission (\$66,933); materials and supplies, including software licenses, student laptops and recording devices (\$4,100); and indirect costs (\$122,330).

Project Director:

Jodi Schneider, PhD, is an Assistant Professor at the UIUC iSchool. The PI has proven expertise on the impact of publication status, e.g., retraction of publications ([Cheng et al. 2019](#); [Dinh et al. 2019](#); [Schneider 2020](#)) and knowledge maintenance in the wake of retraction ([Fu & Schneider 2020](#)). This project is complementary to her work on experts' use of scientific evidence ([Grizzle et al. 2020](#); [Hoang & Schneider 2018](#)) and scientific controversies ([Hsiao, Fu, & Schneider 2020](#)). It will draw on her work in progress on public health controversies in the news media. She has existing relationships with potential gatekeepers; for instance, she interviewed Wikipedia editors for her dissertation work ([Schneider 2014](#)). She teaches courses in knowledge organization and STS such as Information Organization & Access, Information Modeling, and Knowledge Infrastructures. The PI is the recipient of the 2012 A.R. Zipf Fellowship from the Council on Library and Information Resources for leadership and technical achievement in information management. For more information about her research and teaching, visit: <http://jodischneider.com/jodi.html>