

Building Trust: Defining Subject Matter Expertise through U.S. Federal Peer Review Policy

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Abstract

There is no quantifiable definition of what comprises a peer reviewer, leading to a lack of trust in the outcomes of peer review by the public and some government officials. Using contextual content analysis, this study uncovered concepts from federal science policy and agency peer review guidance documents to begin the creation of such a definition. The first stage determined which term is most often used for a peer reviewer as seen in the U.S. Office of Management and Budget's (OMB) Final Information Quality Bulletin for Peer Review 2005. The second stage analyzed the U.S. Department of Energy, Energy Efficiency & Renewable Energy, the U.S. Department of Interior, Bureau of Safety and Environmental Enforcement and the U.S. Department of Justice, Office on Violence Against Women peer review guidelines to determine the number of mentions of each concept (knowledge, skills, experience), if a definition of a merit peer reviewer is provided, and descriptors associated with qualities, or sub-concepts pertaining to peer reviews including discipline, teaching, education, postdoctoral positions, certifications, grant funding, publications, presentations, awards and consulting work. Stage one results found that the term reviewer is the most used in describing a peer reviewer for all three federal agencies and the OMB bulletin. Results of stage two show that both knowledge (M=9) and experience (M=14.33) categories were the largest reported with few mentions of skills (M=3.33). Each agency provided a definition of reviewer and qualifications they must meet. This analysis of three federal peer review guidance documents shows that the federal guidance on expertise, if measured by both experience as well as knowledge, is being followed. It would be a worthy effort to do an analysis of the publications, experience and knowledge of those selected for peer review and compare it to each agencies criteria to build a profile of reviewer characteristics. In addition to contributing to the scant literature on peer review, these findings will help narrow the qualities merit peer reviewers need and will assist with future research exploring all U.S. Federal Agency peer review manuals in which qualities in both knowledge and experience could be quantified, helping to defining an accurate measurement of goodness of fit for reviewers.

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BACKGROUND / LIT REVIEW

Thank you for your interest in peer review. Please view the 4:16 minute video below to learn more on this research as well as a quick review of the literature.

In essence, peer review at its core is a method used to help agencies allocate finite resources such as grant funding or even time on supercomputers or telescopes. Although it is the most reliable and trusted system for research grant evaluation, peer review does have issues that can lead to lack of trust.

Might a clear definition of peer reviewer qualifications assist in (re)building trust in this scientific evaluation tool?

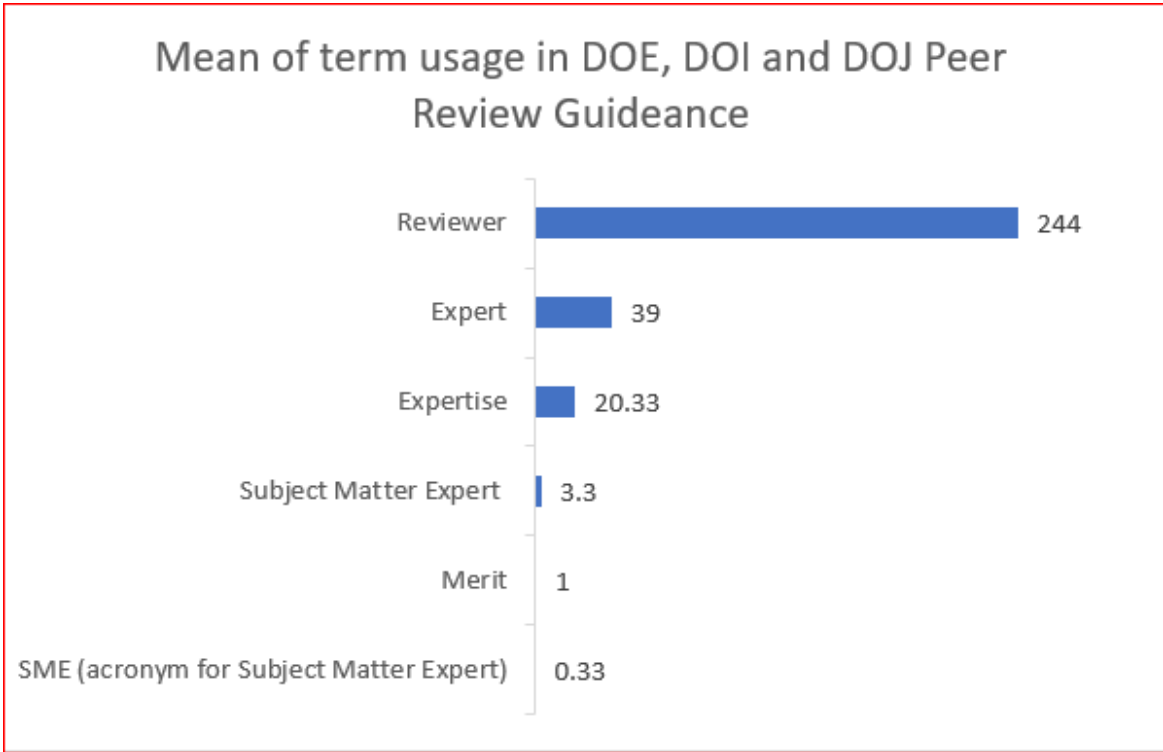
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RQ1: WHAT DOES THE U.S. GOVERNMENT CALL A PEER REVIEWER?

The Final Information Quality Bulletin for Peer Review 2005, issued by U.S. Office of Management and Budget (OMB) was analyzed to determine which of the following terms was utilized most often in the federal lexicon: reviewer, merit, subject matter expert. This document was chosen to serve as the place to look for definitions and qualities as it serves as the most recent federal guidelines that all peer reviews which allocate federal resources (funds, equipment, time, etc.) must follow. Searching these synonyms allowed for best practices in searching for peer reviewers in the future.

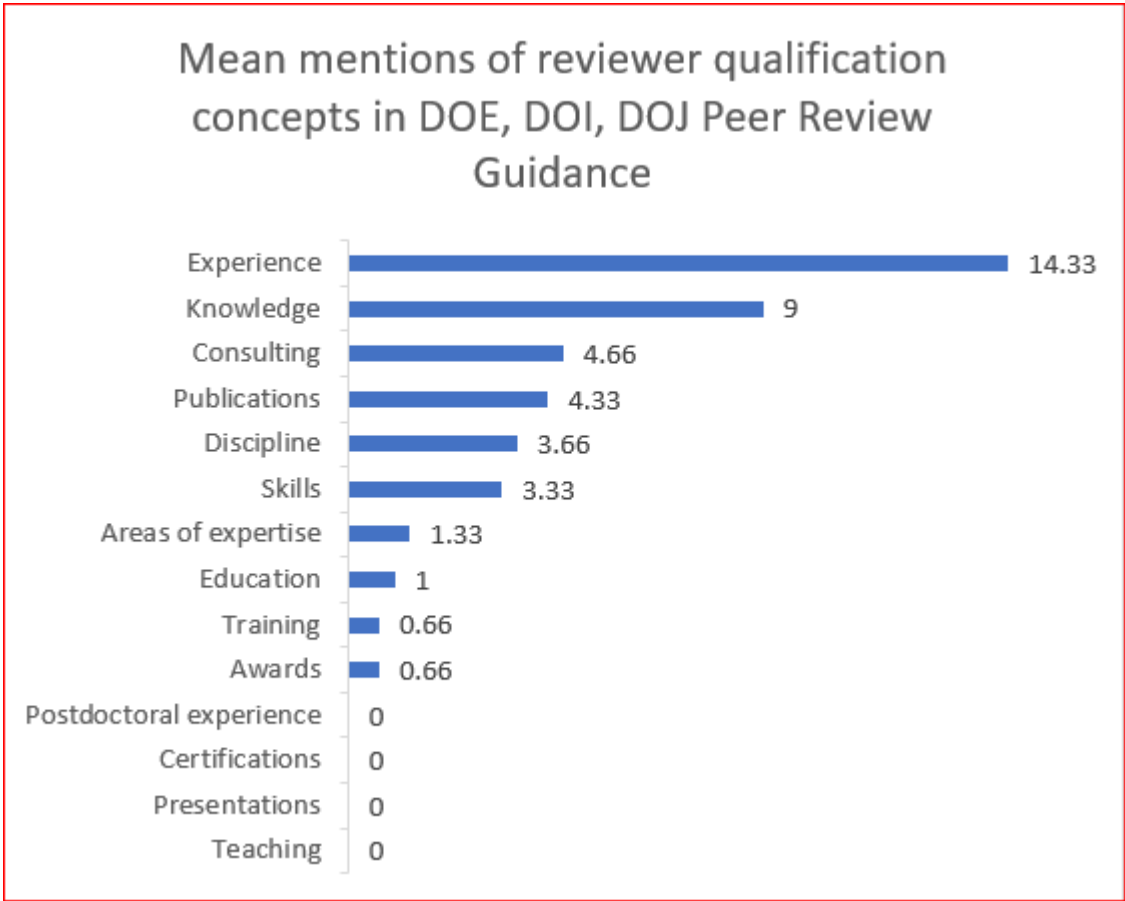


These results were then tested by analyzing the following agency documents, the most recent peer review guidance for each of these departments:

- Department of Energy, Energy Efficiency & Renewable Energy (DOE EERE), *EERE 810 Peer Review Guidance*, June 2016.
- Department of Interior, Bureau of Safety and Environmental Enforcement (DOI BSEE), *Peer Review Process Handbook 501.1H*, July 2017.
- U.S Department of Justice, Office on Violence Against Women (DOJ OVW), *FY 2017 Office on Violence Against Women Peer Review Guidelines*, January 2017.

RQ2: WHAT QUALITIES ARE MOST HIGHLY VALUED IN A PEER REVIEWER?

Since OMB states experience, skills and knowledge are most needed in a reviewer, it was expected to see these three terms regularly used together. Additionally, it was interesting that both the knowledge (M=9) and the experience (M=14.33) categories were the largest reported, yet few mentions of skills (M=3.33). Might it be that real-life experience as well as knowledge are the focus of future efforts narrowing down qualifications of peer reviewers?



Each agency provided a definition of a reviewer as well as a list of qualifications that the reviewers must meet. Of note, DOE EERE reviewer guide has an entire appendix detailing specific, detailed qualifications that reviewers must meet (p. 18) and by far has the most detail of the three and has plenty of if/then logic steps to take if hard decisions are needed to be made on a particular reviewer.

DOE EERE Peer Review Guide

Definition: "Reviewers are selected based on their expertise and their respective fields and provide independent and objective feedback" p. 7.

Qualities:

- "At least 5 years of experience in a relevant field
- Publications and patents
- Other evidence that the person is a recognized expert in their field
- An advanced degree (Ph.D., Sc.D., D. Eng., M.S. or M.B.A.
- Relevant Awards
- Key Society Membership" p. 18.

DOI BSEE Peer Review Process Manual Version 2

Definition: "A peer reviewer is an independent, qualified expert in a relevant technical field whose services are retained by BSEE (or a contractor) to evaluate a draft research product" p. 18.

Qualities:

- balance
- technical
- diverse
- independence
- external

DOJ OVW FY 2017 Office on Violence Against Women Peer Review Guidelines

Definition: "The vast majority of OWW peer reviewers are active practitioners or recent retirees from relevant sexual assault, domestic violence, dating violence or stalking professions" p. 3.

Qualities:

- up-to-date
- on-the ground
- specific positions considered: victim advocates, judges, prosecutors, representatives from community-based and faith-based organizations, law enforcement, legal professionals
- audiences worked with: tribal communities, culturally specific populations, college and university communities, rural areas, urban areas, individuals working with persons with disabilities and persons over 50 years of age.

METHODS

A conceptual analysis of the content pertaining to the grant funding process documentation from three U.S. Federal Agencies were coded using predetermined concepts uncovered in reading the *Final Information Quality Bulletin for Peer Review*.



The three Agency peer review guidelines (DOE, DOI and DOJ) were analyzed to determine 1) the number of mentions of each concept, 2) if a definition of a grant peer review is provided, and 3) descriptors associated with qualities pertaining to peer reviewers including discipline, areas of expertise, teaching, education, postdoctoral [positions, certifications, grant funding, publications, presentations, awards and consulting work.

CONCLUSIONS / FUTURE RESEARCH

After determining the correct term of “reviewer” for best searching results, a look back at the OMB Bulletin shares that “the most important factor in selecting reviewers is experience: ensuring that the selected reviewer has the knowledge, experience, and skills necessary to perform the review.”

This evaluation of three federal agency peer review guidance documents shows that the federal guidance on expertise, if measured by both experience as well as knowledge, is being followed. During this analysis it became clear that the selection of reviewers should be based on their experiences as well as knowledge. Yet, does a true definition, or even a quantifiable answer exist to define these two terms?

Further research could include a data mining effort including all U.S. Federal Agencies peer review manuals to determine differences in types of peer reviews required per agency, department and office. Additionally, the psychological literature on what it takes to make an expert (Ericson, 2018) and how it relates to peer review and the scientific communication process may bring a new light to this line of questioning.

DISCLOSURES

Meredith P. Goins is employed by Oak Ridge Associated University, is a PhD student at the University of Tennessee-Knoxville College of Communication and Information and her committee currently consists of Dr. Suzie Allard and Dr. Carol Tenopir. Meredith is also a lecturer at the University of Tennessee-Knoxville School of Information Science.

AUTHOR INFORMATION

Meredith P. Goins, MSIS, group manager and science librarian at Oak Ridge Associated Universities (ORAU), leads Research Services, a multidisciplinary team that identifies and recruits subject matter experts for state, federal, and international funding agencies and universities. In less than 10 years, this team has connected with over 28,000 subject matter experts (SMEs) in over 50 disciplines matching them to proposals and applications in grant peer review. Through this experience, Meredith became a reviewer advocate, making sure that timelines, honoraria, and processes were beneficial for the reviewers who will perform the review in the future.

This advocacy lead her to research peer review SMEs. What are their preferences? How do they prefer to communicate? What timelines are acceptable? What honoraria is appropriate? To take her research further, Meredith returned to the University of Tennessee-Knoxville College of Communication and Information to pursue her Ph.D. focusing on scholarly communications and peer review.

ABSTRACT

There is no quantifiable definition of what comprises a peer reviewer, leading to a lack of trust in the outcomes of peer review by the public and some government officials. Using contextual content analysis, this study uncovered concepts from federal science policy and agency peer review guidance documents to begin the creation of such a definition.

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<p>Defintion: "Reviewers are selected based on their expertise and their respective fields and provide indepentent and objective feedback" p. 7.</p>	<p>Defintion: "A peer reviewer is an independent, qualified expert in a relevant technical field whose services are retained by BSEE (or a contractor) to evaluate a draft research product" p. 18.</p>	<p>Definition: "The vast majority of OWW peer reviewers are active practitioners or recent retirees from relevant sexual assault, domestic violence, dating violence or stalking processions" p. 3.</p>
<p>Qualities:</p> <ul style="list-style-type: none"> • "At least 5 years of experience in a relevant field • Publications and patents • Other evidence that the person is a recognized expert in their field • An advanced degree (Ph.D., Sc.D., D. Eng., M.S. or M.B.A. • Relevant Awards • Key Society Membership" p. 18. 	<p>Qualities:</p> <ul style="list-style-type: none"> • balance • technical • diverse • independence • external 	<p>Qualities:</p> <ul style="list-style-type: none"> • up -to-date • on-the ground • <u>specific positions considered:</u> victim advocates, judges, prosecutors, representatives from community-based and faith-based organizations, law enforcement, legal professionals • <u>audiences worked with:</u> tribal communities, culturally specific populations, college and university communities, rural areas, urban areas, individuals working with persons with disabilities and persons over 50 years of age.

Table 3 Definition and Qualities of Peer Reviewers

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