



Publishing Behavior of Engineering Faculty

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Publishing Practices Among Engineering Faculty and Instructors

Abstract

Promotion, rank, and tenure (PRT) guidelines have long been identified as a crucial factor in the perpetuation of particular publishing practices. These guidelines have been criticized by some including librarians and open-access advocates for slowing the transition to more open and equitable systems of publication. However, discipline-specific faculty have rarely been approached as a group to glean their views on PRT and the factors that influence their publishing choices. To better understand this issue, the engineering and scholarly communication librarians at a rural land-grant university interviewed engineering faculty about their publishing choices.

The first goal of the study was to collect responses about the role of PRT guidelines as they relate to individual publication practices. The second goal of the study was to take a holistic approach and examine engineering faculty's criteria during the publication selection process as it relates to formal and informal publishing. Faculty publishing choices are not exclusively dependent on one set of guidelines; therefore, by exploring PRT in tandem with other criteria for selecting publishing venues, the authors expect to gain a deeper understanding of current publishing practices within engineering. Using this deeper understanding, the engineering librarian and scholarly communication librarian plan to educate departments, colleges, and the university leadership to work towards a more open and equitable scholarly landscape. While some larger institutions have spoken out about these issues this project focuses on the perspectives from a specific group of faculty at a public land-grant institution and will, thus, contribute to an understanding of the issues at play and possibilities for future advancement in PRT guidance.

Introduction

Researchers have long expressed concerns about the impact promotion, rank, and tenure (PRT) guidelines have on the publishing practices of academics [1-4]. As a baseline, studies [1-4] have shown that faculty members expect a strong research and publication record to be crucial for advancement under PRT guidelines. Research also shows that these expectations cause untenured and tenured faculty to publish in separate venues based on their differing engagement with PRT [5-7]. The pressure to publish can create problems such as prioritizing the quantity of articles and pursuit of superior journal metrics rather than the quality of research [8-10]. Retractions of articles can result as well as shoddy documentation of research processes, thus reducing reproducibility [11, 12].

In response to these concerns, academics have suggested that PRT guidelines be revised to encourage more sustainable, equitable, and open publishing practices. Suggested alterations to guidelines include expanding the range of accepted research materials, encouraging publication in open access venues, and altering metrics to reward publication outside of traditional journals [1-4]. These issues have been discussed at the macro level by administrators at large research institutions [13].

Large-scale surveys such as the one carried out by Niles, et al [6], have shown strong connections between PRT and publishing choices even when academics personally do not place

great emphasis on traditional assessment criteria such as publication quantity or journal impact factor. Although this work has been done at scale, the authors of this study wanted to contribute to the discussion by surveying faculty members at our university. We believe that this survey contributes to a discipline-specific understanding of publishing decisions, particularly as they pertain to PRT guidelines. The outcomes of the study were to:

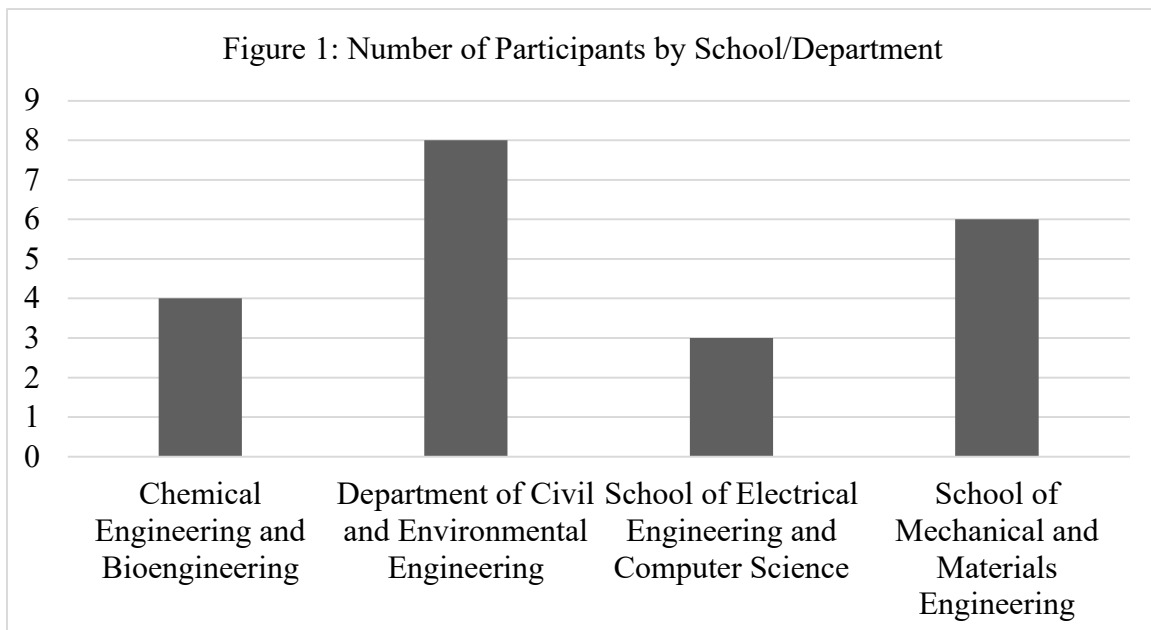
1. Collect responses about the role of PRT guidelines as they relate to individual publication practices
2. Take a holistic approach and examine engineering faculty's criteria during the publication selection process as it relates to formal and informal publishing (blogs, social media posts).

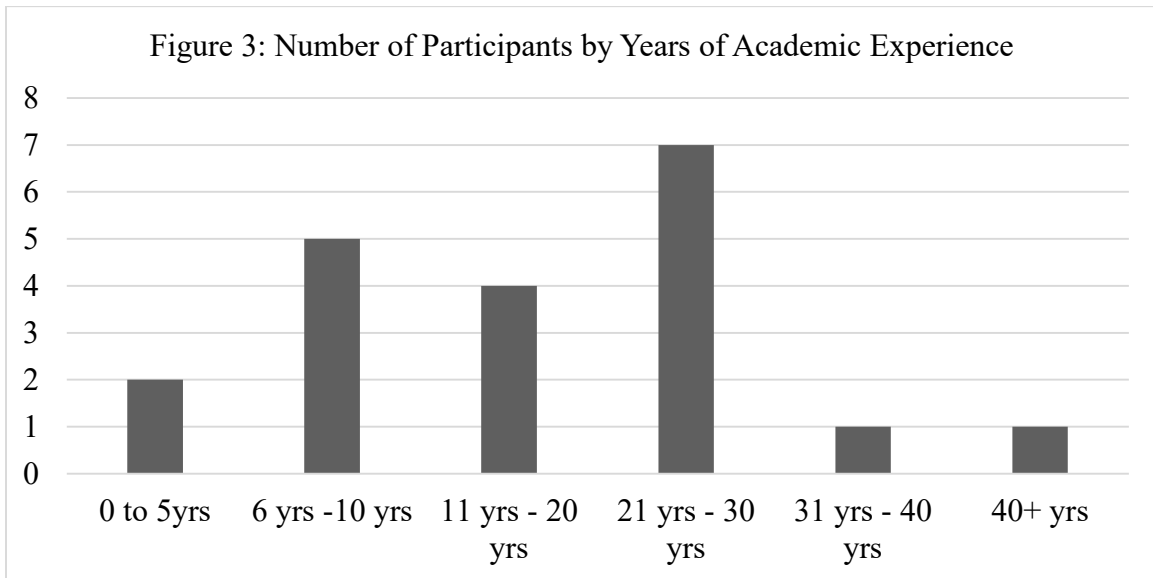
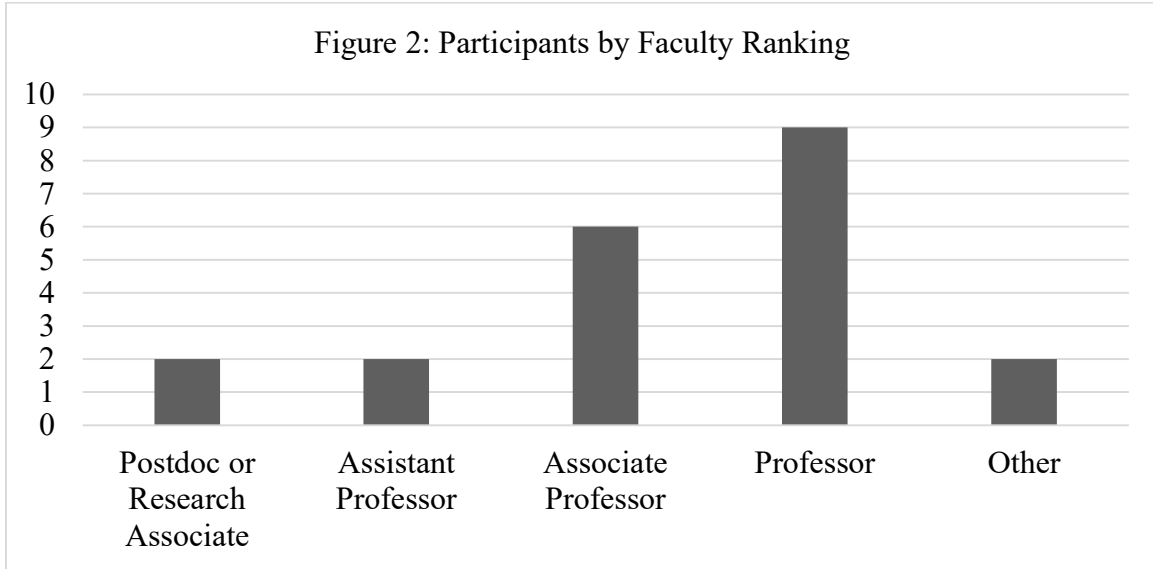
Faculty publishing choices are not exclusively dependent on one set of guidelines; therefore, by exploring PRT in tandem with other criteria for selecting publishing venues, the authors expect to gain a deeper understanding of current publishing practices within engineering. The data collected during this survey will guide the university in working toward a more equitable space.

Method

To gain insight into publishing choices, we began by distributing a survey to the faculty, clinical faculty, and instructors in the College of Engineering at our land-grant institution (Appendix A). Before sending surveys and during the development of this research, we petitioned for and received exempt status from our University IRB following review by the Office of Research Assurances.

Once released, our survey had a 12% completion rate, which was 21 responses out of 176 faculty and instructors contacted. While these responses are by no means considered comprehensive nor representative of all engineering faculty. Figure 1 shows the demographic breakdown of the respondents by department or school within the College of Engineering. Figure 2 shows the breakdown of respondents by faculty or instructor ranking and Figure 3 by years in academia.





Results

Participants in the survey were asked to state and rank their top three criteria when choosing a place of publication for their scholarly work. Figure 4.1-4.3 shows that faculty value journal audience and a publication's reputation most highly when making this choice. In our reporting, we have chosen to separate journal reputation from impact factor due to the language used by faculty on the survey. Some explicitly listed impact factor as opposed to reputation of publishing venue.

Figure 4.1: Top Criteria for Engineering Publishing

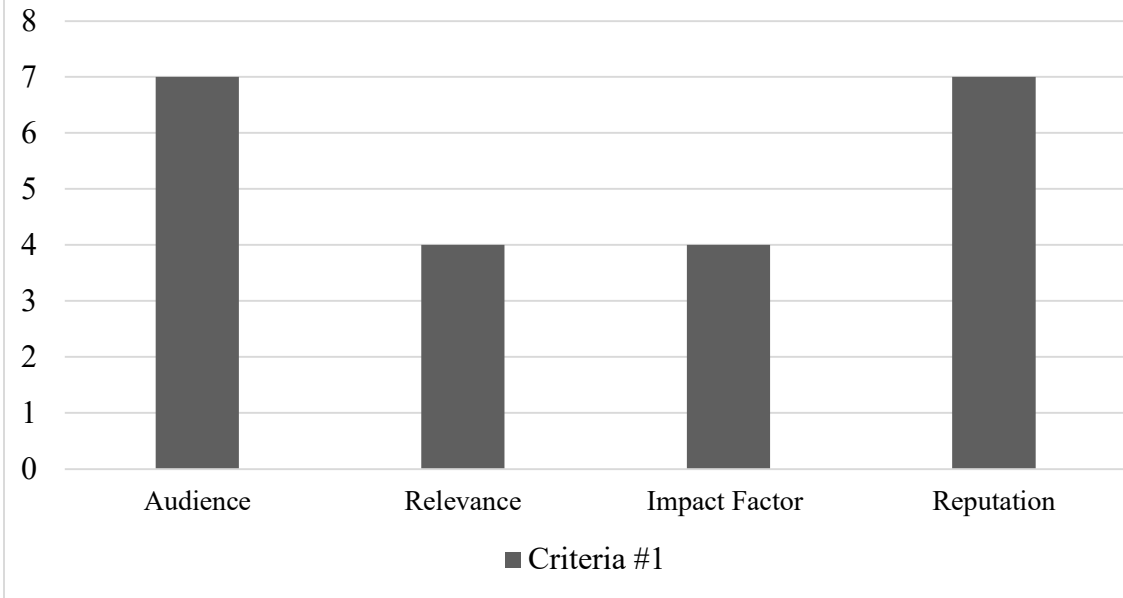
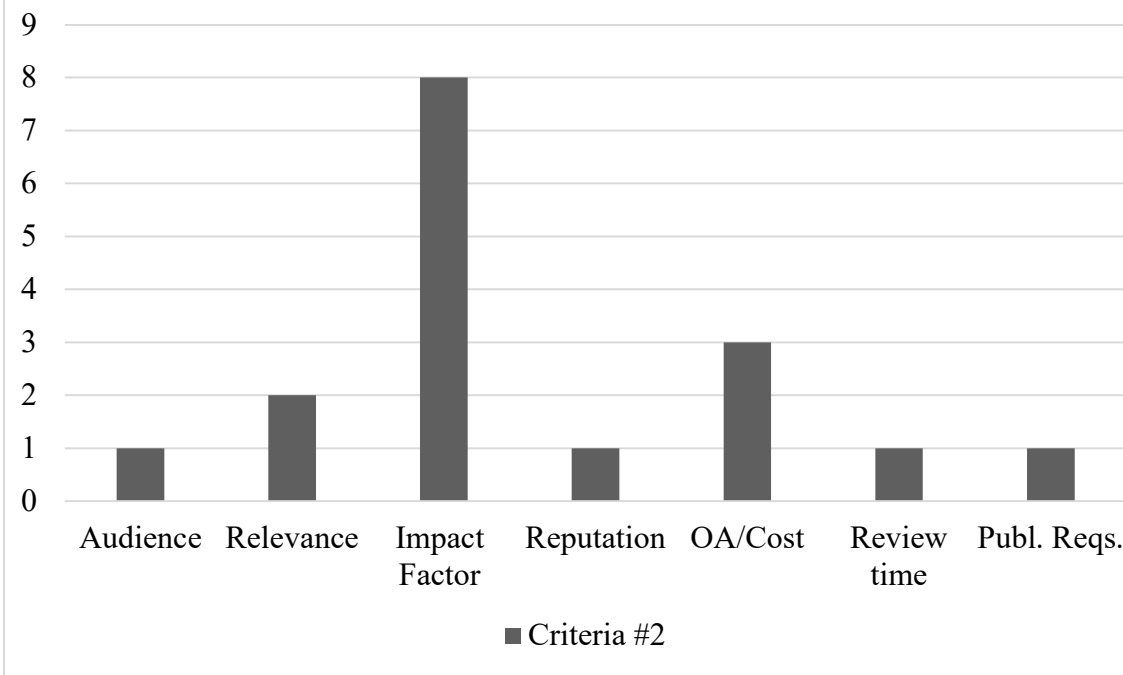
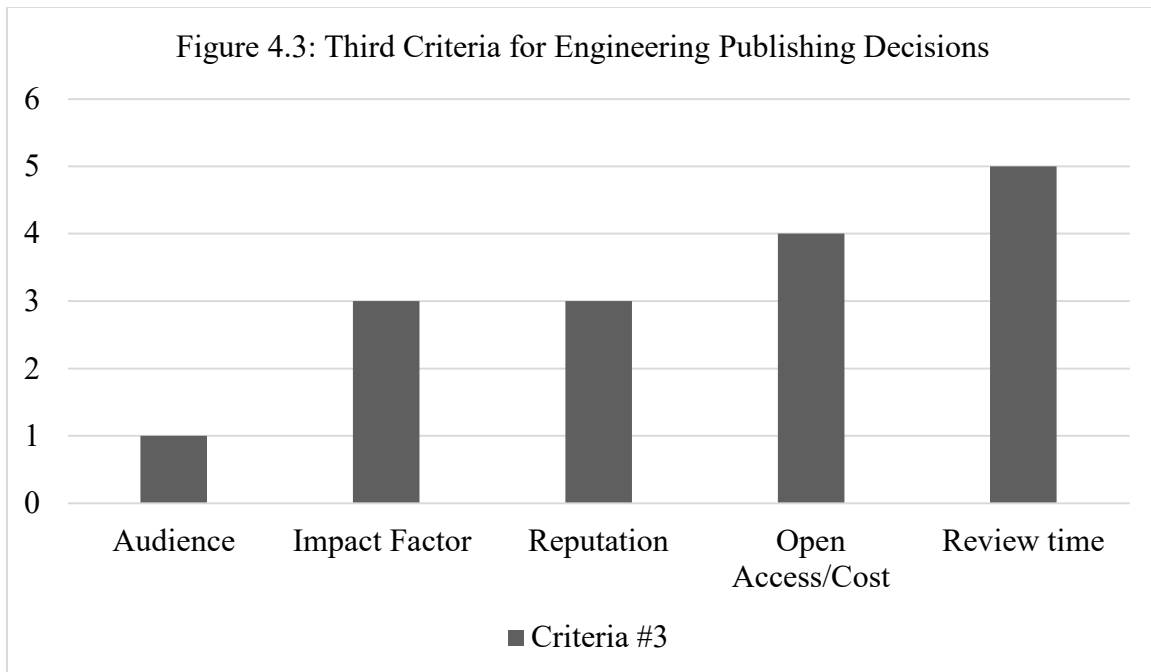


Figure 4.2: Second Criteria for Engineering Publishing Decisions





Moving beyond their current criteria, faculty were asked about how they were advised in publishing choices as new faculty or graduate student as well as how they now advise their own students or new professionals. Many respondents stated that they received little to no guidance as graduate students or new professionals on publishing of scholarly work. Others noted that they instruct their students and new professionals to consider audience when selecting a publication venue and strive to produce quality research rather than a large quantity of it. One respondent referenced the changes of publishing practices over their career:

Things were very different when I was a grad student. We published strictly in traditional journals in our area of research. We did not worry about the impact factor, just suitability. Now I tell my students to publish in open-access journals with high impact factors. Of course, they have to be suitable, and oftentimes I'm willing to swap impact factor for the cost of OA publishing.

Regarding advising, faculty mentioned instructing students to look to the papers they are citing for sources of potential publication. They also cited future career goals as a lens they use when looking at places of publication.

To better understand how scholarly works are being disseminated, we asked survey participants if they have ever considered publishing outside of traditional publishing formats including journals, books, or conferences proceedings. One third of participants have never considered any other format of publishing. These respondents further noted that they had not considered other formats because non-traditional publications would not count towards promotion or tenure. One participant stated that they did not have the freedom to publish outside of traditional formats and another lamented that in order for their work to have impact, they need to stick with the traditional formats.

As further support to the above, one respondent mentioned that they had not considered other formats because “the only currency which counts is the number of papers, not even their quality, only quantity.”

The final survey question asked respondents to consider how and if publishing choices change over an academic career. One participant mentioned changes in research interests and noted how those shifts affected their choice in publishing venue. Another participant explained that journal quality was less of a concern at the beginning of their career but also noted that their discipline influenced this shift by emphasizing journal quality more over time. Another participant pointed to a shift in the value of impact factor due to the fluctuation of impact factor over their career. Reiterating a similar point, one faculty member stated that when they arrived at this institution 30+ years ago, impact factors were not something that was considered in selecting publication venues.

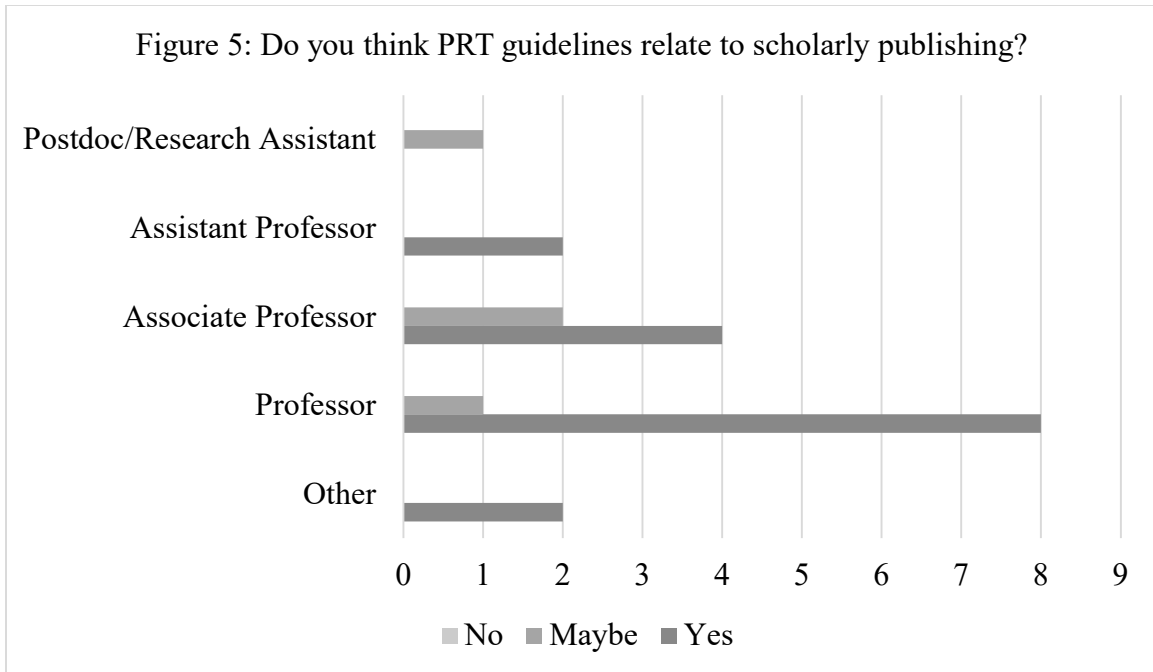
In a similar vein to the above comments on fluctuations in the perceived value of impact factors, a participant stated that:

Papers have gotten shorter with more emphasis on publishing more papers in higher impact factor journals, a preference for translational work over fundamentals and less emphasis on the engineering/scientific aspects of the work.

This point also reinforces what multiple faculty reported on the survey—that papers over the course of their careers have gotten shorter in length as the pressure to publish dissipated.

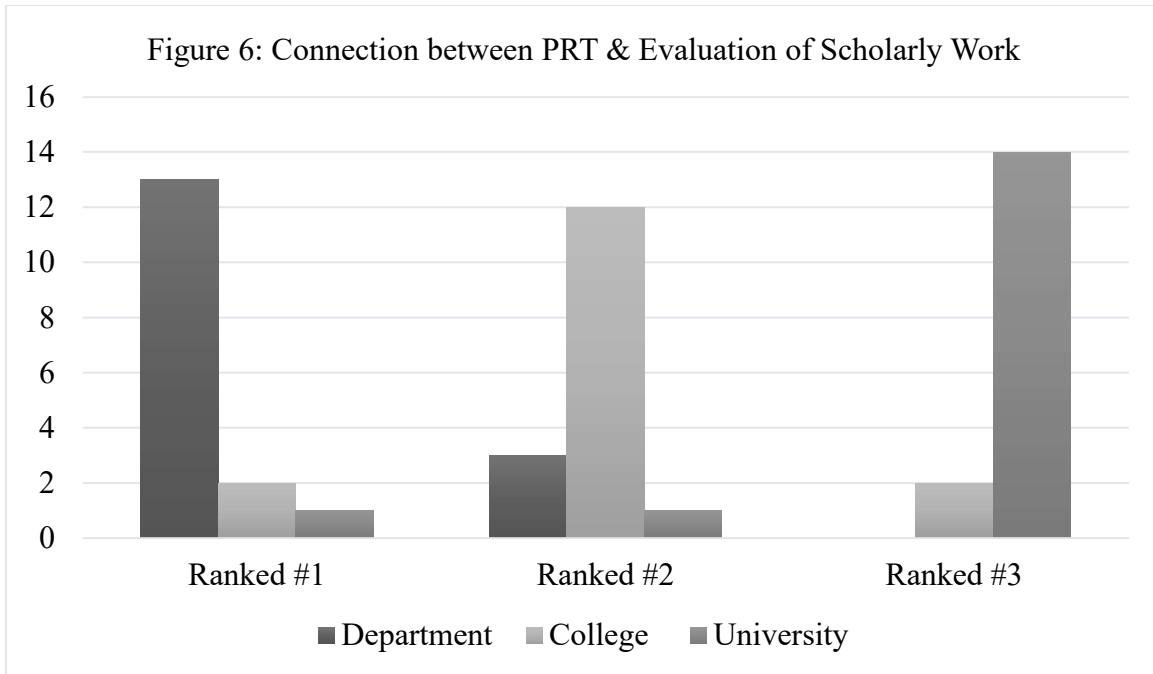
One faculty member commented on academia’s relative inability to assess non-traditional formats of scholarly publishing. Another respondent similarly mentioned that presentations and non-traditional formats of publishing are not taken as seriously by engineering faculty and administration.

The second part of the survey focused more specifically on the possible connection between publishing practices and the PRT process. Figure 5 shows the results of a question asking respondents whether they believe that PRT guidelines relate to scholarly publishing.



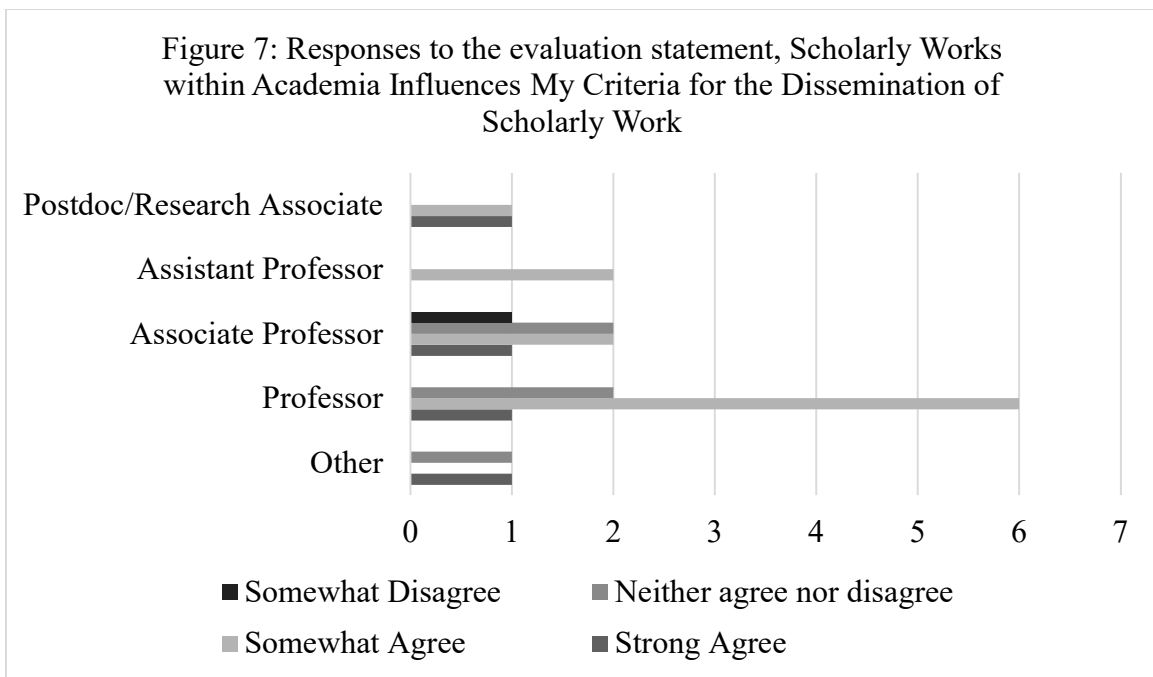
While 76% of the participants believed that the two things are related, 24% replied that they might be related and some justified their answer by noting that promotion is now a “game” rather than an academic/scholarly endeavor. Other participants responded that the two things might be related in that university administration only counts papers and cares nothing for quality of research. Finally, some noted that PRT is dependent on research money rather than publishing records.

Survey participants were next asked to rank the extent to which various levels of administration at the university place emphasis on PRT guidelines when assessing faculty publications. Respondents ranked departments as the site where PRT and evaluation of scholarly work is most connected (Figure 6).



Next, participants were asked to rate the following statement: “The evaluation of scholarly works within academia (promotion & tenure, annual reviews) influences my criteria for the dissemination of scholarly work,” on a scale from strongly agree to strongly disagree.

When assessing this statement, respondents showed no consensus corresponding to their faculty appointment type, with full professors being more apt to agree with the statement than their junior colleagues despite the decreased pressure to publish later in one’s career (Figure 7).



Survey respondents were next asked to justify their answer regarding the connection between PRT guidelines and publishing decisions. One participant explained that they would publish their scholarly works regardless of guidelines because of the benefits to the scholarly field. However, this respondent did note that there is a lot of pressure to “maintain and/or constantly increase output,” and added that this is not a sustainable practice. Some justified their answer by stating that they try to follow the requirements of PRT and that the guidelines directly influence their publishing decisions. More frequently, survey respondents mentioned the lack of university support for non-traditional publishing formats when they indicated that PRT and publishing choices are linked.

Some participants argued that funding or other metrics are more frequently used to measure faculty performance, and for this reason indicated that PRT and publishing choices are only somewhat related.

While most of the full professors “somewhat agreed” that PRT guidelines are connected to publishing decisions, many of them in their justification also stated that they are not concerned with the connection due to their academic rank.

One participant agreed that PRT is connected to publishing decisions, they also offered a different perspective by pointing out that, “If the guidelines were more spread out across different dissemination forms, then the influence [of PRT] would be lower.”

Going beyond the connection between PRT and publishing decisions, some participants mentioned the difficulty in evaluating scholarly works across different research areas and the difficulty of providing unbiased reviews of peers.

Discussion and Conclusion

When working to make the university publishing landscape more equitable, having input about publishing practices and faculty beliefs about the connection to PRT guidelines has helped us prioritize our plan moving forward. The first priority is to connect more strongly with the graduate students on our campus from both the library perspective but also to collaborate with engineering faculty to educate graduate students regarding publishing practices. This became clear from the survey results when many responses included that they had had little to no support regarding publishing practices when they were graduate students.

The second priority is to have discussions with engineering administrators regarding the perception that little critical peer evaluation occurs among faculty members in the College of Engineering. Helping to make the evaluation process more meaningful for faculty members could guide the university status quo away from a simple preference for quantity rather than quality of publications. Along with this point, the librarians hope to initiate conversations around assessment of both traditional formats and non-traditional formats. With greater variety in the types of publishing permitted at the university could come a greater interest in alternative formats like open access publications, blogs, datasets, and open educational resources.

Third priority is to work with university administration to consider how PRT guidelines could be shifted to allow for greater variety in publishing practices. Our survey revealed that PRT guidelines have the possibility to influence engineering faculty publishing decisions. As such, university administrations have the potential to shift publishing practices to bring about a more

sustainable, equitable, and open academic landscape. We hope that this paper can help further the discussion about the support for more open and sustainable methods of scholarly communication and more specifically be a catalyst for discussions with engineering faculty.

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Appendix A

Engineering Publishing Survey

Study Title: Publishing and Engineering

Co-PIs: Chelsea Leachman and Talea Anderson

Purpose of the Study The first goal of this survey is to collect responses from engineering faculty at a land-grant university about the role of promotion, rank and tenure (PRT) guidelines as they relate to individual publication practices. The second goal of the survey is to take a holistic approach and examine engineering faculty's criteria during the publication selection process as it relates to formal and informal publishing. Data collected will provide the university community with insight on publishing decisions and criteria used when disseminating scholarly works. You are being asked to participate because of your faculty appointment.

What will I do if I choose to be in this study? You will be asked to answer questions related to the teaching and open educational resources. Your responses will be recorded and stored on a (University Name) server.

How long will I be in the study? The duration of participation is approximately 5-10 minutes.

What are the potential risks and benefits? There are minimal risks associated with participation in this project. The risks are no greater than the participant would encounter in daily life or during the performance of routine physical or psychological exams or tests. However, the breach of confidentiality is a risk common to this type of research projects. All effort will be used to maintain confidentiality as outlined below. There are no direct benefits to you. However, the field, and specifically engineering and engineering scholarly activity at (University Name), may benefit from the results.

Will information about me and my participation be kept confidential? All effort will be used to maintain confidentiality. The project's research records may be reviewed by departments at (University Name) responsible for regulatory and research oversight. You will not be asked any sensitive questions. All data collected will be stored in a locked office in a locked file cabinet, or on a secure, password-protected network (University Name) using a file naming system that does not include any identifiable information. Only the researchers will have access to the data. Identifiable information will not be kept along with the data.

What are my rights if I take part in the study? Your participation in this study is voluntary. You may choose not to participate or, if you agree to participate, you can withdraw your participation at any time without penalty or loss of benefits to which you are otherwise entitled.

Who can I contact if I have questions about the study? If you have question, comments or concerns about the research project, you can talk to one of the researchers: (Researchers Names and Contact). If you have

questions about your rights while taking part in the study or have concerns about the treatment of research participants, please call the Institutional Review Board at (IRB Phone Number).

Research Study Exempt Status This study has been certified as exempt from the need for review by the (University Name) Institutional Review Board.

Documentation of Informed Consent I have had the opportunity to read this consent form and have the research study explained. I have had the opportunity to ask questions about the research study, and my questions have been answered. I am prepared to participate in the research study described above.

By clicking "Agree" you are acknowledging the potential risks above.

- AGREE (1)
- DISAGREE (2)

Skip To: End of Survey If By clicking "Agree" you are acknowledging the potential risks above. = DISAGREE

1 School or Department

- School of Chemical Engineering and Bioengineering
- Department of Civil and Environmental Engineering
- School of Electrical Engineering and Computer Science
- School of Mechanical and Materials Engineering
- Other: _____

2 Faculty Appointment

- Assistant Professor
- Associate Professor
- Professor
- Postdoc or Research Associate
- Other: _____

3 Number of years within academia?

- 0-5
- 6-10
- 11-20
- 21-30
- 31-40
- 40+

4 What are your top three criteria when choosing a place to publish your scholarly work?

- #1 _____
 - #2 _____
 - #3 _____
-

5 When starting as a graduate student or new faculty member, how were you advised about publishing choices? How do you advise undergraduate or graduate students on publishing scholarly outputs?

6 When considering dissemination of scholarly activity, have you considered other options outside of traditional publishing formats?

7 Do you think publishing choices change over an academic career? If so, how?

8 Do you think that promotion and tenure guidelines relate to scholarly publishing?

- Yes
- Maybe _____
- No

9 Rank the following on where you think the evaluation of scholarly works is most connected to promotion and tenure guidelines:

_____ College
_____ Department
_____ University

10 Please evaluate the following statement:

The evaluation of scholarly works within academia (promotion & tenure, annual reviews) influences my criteria for the dissemination of scholarly work.

- Strongly agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Strongly disagree

11 What is the justification for the answer to question 8?

12 Additional comments: