

Opportunities to Improve Academic Research Through Open Research Practices

Devin R. Berg
University of Wisconsin-Stout

Universities play a vital societal role as creators and promoters of public knowledge. Through this role, universities make significant contributions to the continued economic, social, and technological development of society. The Morrill Act of 1862 stipulates that universities support the economic development of the state through the liberal and practical education of the people (*Public Research Universities*, 2016). Further, universities often act as centers for economic growth and stability in their regions.

Advances in digital technology have opened new pathways for the conduct and dissemination of scholarship. Through these pathways, it has become easier for the faculty and institutional leadership to market the business of the university, as clearly as possible, as a service provider to the many relevant stakeholders. By disseminating and distributing the products of university activities as widely as possible through open access publishing, open research, and open innovation, we demonstrate the impact that these products have on the local, state, national, and international populations. In addition to these motivations, arguments can be made that, since the majority of university research is publicly funded, the outputs of that work should be freely accessible by the public.

Participation in open research practices provides inherent benefits for the researcher as well. Open access publishing leads to greater citation count for research articles and thus researchers obtain career benefits under the traditional metrics of academic success and, further, sharing code and data can also result in higher citation counts (Berg, Niemeyer, & Fleischfresser, 2016; Eysenbach, 2006; McKiernan et al., 2016; Norris, Oppenheim, & Rowland, 2008; Piwowar, Day, & Fridsma, 2007; Piwowar & Vision, 2013; Vandewalle, 2012). In addition to these traditional metrics of research evaluation, researchers and institutions should also develop targets and metrics to evaluate the broader impacts of academic research. The societal impacts of the work are likely more important but also more difficult to quantify.

There are several opportunities for institutions and administrators to support open research practices, as outlined in (Berg & Niemeyer, 2018). Through this presentation, I will discuss the benefits and challenges facing the researcher looking to implement an open workflow as well as the tools available to do so. I will also discuss some possible changes needed in research evaluation and institutional administration necessary to help institutions realize the benefits of open practices and navigate the rapidly changing landscape of native digital tools for research dissemination.

References

- Berg, D. R., & Niemeyer, K. E. (2018). The case for openness in engineering research [version 1; referees: 2 approved with reservations]. *F1000Research*, 7, 501.
<https://doi.org/10.12688/f1000research.14593.1>
- Berg, D. R., Niemeyer, K. E., & Fleischfresser, L. (2016, August 25). [Editorial] Open Publishing in Engineering. Retrieved March 8, 2018, from <https://www.tjoe.org/pub/open-publishing-in-engineering>
- Eysenbach, G. (2006). Citation Advantage of Open Access Articles. *PLOS Biology*, 4(5), e157.
<https://doi.org/10.1371/journal.pbio.0040157>
- McKiernan, E. C., Bourne, P. E., Brown, C. T., Buck, S., Kenall, A., Lin, J., ... Yarkoni, T. (2016). Point of View: How open science helps researchers succeed. *ELife*, 5, e16800.
<https://doi.org/10.7554/eLife.16800>
- Norris, M., Oppenheim, C., & Rowland, F. (2008). The citation advantage of open-access articles. *Journal of the American Society for Information Science and Technology*, 59(12), 1963–1972.
<https://doi.org/10.1002/asi.20898>
- Piwowar, H. A., Day, R. S., & Fridsma, D. B. (2007). Sharing Detailed Research Data Is Associated with Increased Citation Rate. *PLOS ONE*, 2(3), e308. <https://doi.org/10.1371/journal.pone.0000308>
- Piwowar, H. A., & Vision, T. J. (2013). Data reuse and the open data citation advantage. *PeerJ*, 1, e175.
<https://doi.org/10.7717/peerj.175>
- Public Research Universities: Serving the Public Good*. (2016). Cambridge, MA: American Academy of Arts & Sciences. Retrieved from
<https://www.amacad.org/content/publications/publication.aspx?d=22104>
- Vandewalle, P. (2012). Code Sharing Is Associated with Research Impact in Image Processing. *Computing in Science & Engineering*, 14(4), 42–47. <https://doi.org/10.1109/MCSE.2012.63>