

A WORD FROM...

Jennifer J. Quinn, President of the MAA



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Courtesy of Mark O. Martin.

I believe myself to be an optimist. Yet, I cannot overlook issues in the mathematics community and the academy that need improvement. No one person has a solution—especially not me. A first step is awareness and a willingness to engage.

When you scan the mathematics environment, what do you see? Admittedly, impressions are biased by personal experiences. I am a full professor at a primarily undergraduate, urban-serving, public institution and president of a sister mathematics association. I have observed:

- **Declining membership in professional organizations.** Membership concerns have been a frequent topic of discussion by the societies involved in the Conference Board of the Mathematical Sciences.¹ In her 2018 State of the AMS report, Catherine Roberts wrote “we saw an increase in the number of regular members for the first time in at least eight years. Although our total membership numbers continued to decline (as is being experienced across all professional societies, so this is not unique to the AMS), numbers decreased at a slower rate than in previous years.”²
- **A greater reliance on non-tenure track faculty to support the educational duties at institutions of higher learning.** Using the most recent data available (2016), AAUP found that 73% of instructional positions at all US institutions of higher education were off the tenure track.³ This erosion in the tenure system weakens protections for academic freedom. Typically, non-tenure track faculty cost less, teach more, and have fewer protections in their positions.
- **Lack of recognition of contributions outside of traditional scholarship.** Peer-reviewed publications remain the gold standard for achievement—even at some institutions that provide minimal support for scholarship. Successfully fulfilling academic responsibilities, typically to include scholarship, teaching, and service, should lead to promotion. Academic responsibilities temporarily shifted during the once-in-a-century disruption to education due to COVID-19. The Herculean efforts in instruction that allowed universities to continue offering courses uninterrupted were rewarded with a pat on the back, a recommendation of more self-care, and for many faculty, a pause on their tenure clock. The loss of research progress during lockdown disproportionately affected women and faculty of color.⁴ Institutional understanding and short-term flexibility are a start but continued emphasis on achievement as measured through traditional scholarship fails to recognize the emergency shift of academic responsibilities undertaken at the behest of these institutions during a global pandemic.

Jennifer J. Quinn is the president of the MAA and a professor at the University of Washington Tacoma. Her email address is jjquinn@uw.edu.

¹See for example the May 2019 or December 2020 CBMS agendas available at <https://www.cbmsweb.org/council-meeting-materials/>.

²C. Roberts, Report of the Executive Director: State of the AMS, 2018, *Notices Amer. Math. Soc.* 66 (2019), no. 7, 1115.

³Data Snapshot: Contingent Faculty in US Higher Ed, published October 11, 2018, <https://www.aaup.org/news/data-snapshot-contingent-faculty-us-higher-ed#.YjjES-rMJD9>.

⁴A. Tugend, On the Verge of Burnout Covid19's impact on faculty well-being and career plans, *Chronicle of Higher Education*, 2020.

- **An exponential growth in publications.** The number of journal articles indexed annually by Mathematical Reviews has doubled over the last 19 years with a growth rate of 3.6%.⁵ Changes in the professoriate have not kept pace. According the 2015 CBMS Survey of Undergraduate programs, the number of full-time faculty in mathematics and statistics departments grew from 28,500 to 33,500 faculty over the same approximate period, between 2000 and 2015.⁶
- **An environment that is not welcoming to everyone.** Climate surveys confirm that harassment, discrimination, and bias persist in academia.⁷ Despite an increased emphasis on inclusion, humanity, anti-racism statements, codes of conduct, and welcoming environment policies, the underlying systems are flawed and need change.

I see these five issues as the result of people, either individually or institutionally, giving too much or too little value to the subject under consideration. When a mathematician chooses not to join a professional organization, they are making a determination of worth. It could be because of a generational shift (the iTunes mentality of buying a single song rather than the whole album), a technological shift (increased access to information on the internet previously only available through membership), or unfamiliarity with the myriad ways associations support mathematicians and advance the understanding of mathematics and its impact on the world. When institutional leaders lean heavily on non-tenure track faculty for financial flexibility, they are valuing the bottom line over long term commitments to and stability of their faculty. When academic culture supports a publish-or-perish paradigm, it overvalues peer-reviewed scholarship, sometimes to the exclusion of achievements in public scholarship, teaching innovation, mentorship, institution building, or service to various communities. It pushes aspiring professionals to seek minimal-publishable-units, perhaps fueling the proliferation of publications. Finally, when an institutional culture intentionally or unintentionally perpetuates an unwelcoming environment, it undervalues its members and denies them equitable opportunities to learn, use, and contribute to the mathematical sciences.

Academia is a strange and hierarchical entity—rooted in privilege and intentional exclusion. Prior to 1773, graduates of Harvard were arranged “according to the dignity of birth, or to the rank of [their] parents.”⁸ To this day, everything and everyone is ranked according to some metric of merit and those not at the apex can be made to feel less than or unwelcome. Now we rank students by test scores or GPA, faculty by publications or citation indices, and institutions by Carnegie Classification or status on the annual lists of “Best Universities and Colleges.”

Initially, I thought the problem lay in the hierarchy itself,⁹ but on reflection that was naive. Proposing an alternate structure was unrealistic—especially when experts in organizational behavior say hierarchies are inevitable in complex societies¹⁰ and philosophers have yet to identify an unambiguous example of a self-organizing (non-hierarchical) society.¹¹ Organizational psychologist Harold Leavitt said, “We cling to hierarchies because our place in a hierarchy is, rightly or wrongly, a major indicator of our social worth.”¹² So eliminating the hierarchy is out.

The Carnegie Foundation for the Advancement of Teaching has done something interesting; it is changing the hierarchy. Its classification system was never intended as an indicator of institutional prestige, only a tool for educational-research comparison. Recently in partnership with the American Council on Education, they rethought the classifications. Beginning in 2023, the Social and Economic Mobility Classification will be launched to recognize and reward institutions committed to and succeeding in creating better futures for diverse, inclusive student populations. US secretary of education Miguel

⁵E. Dunne, Looking at the Mathematics Literature, *Notices Amer. Math. Soc.* 66 (2019), no. 2, 227–230, <https://www.ams.org/journals/notices/201902/rnoti-p227.pdf>.

⁶R. Blair, E. K. Kirkman, and J. W. Maxwell, Statistical Abstract of Undergraduate Programs in the Mathematical Sciences in the United States Fall 2015 CBMS Survey, *AMS*, 2018, p. 32, <https://www.ams.org/profession/data/cbms-survey/cbms2015-Report.pdf>.

⁷E. B. Stolzenberg, M. K. Eagan, H. B. Zimmerman, J. Berdan Lozano, N. M. Cesar-Davis, M. C. Aragon, and C. Rios-Aguilar, Undergraduate teaching faculty: The HERI Faculty Survey 2016–2017, *Los Angeles: Higher Education Research Institute, UCLA*, 2019.

⁸<https://www.harvard.edu/about-harvard/harvard-history/#1600s>

⁹I said as much in the December 2021–January 2022 MAA Focus President’s Message: “Don’t Let Us Get Sick.”

¹⁰B. Sutton, Hierarchy is Good. Hierarchy is Essential. And Less Isn’t Always Better, *eCorner, Stanford University*, April 7, 2016, <https://ecorner.stanford.edu/articles/hierarchy-is-good-hierarchy-is-essential-and-less-isnt-always-better/>.

¹¹K. A. Appiah, Digging for Utopia, *New York Review of Books*, December 16, 2021, <https://www.nybooks.com/articles/2021/12/16/david-graeber-digging-for-utopia/>.

¹²H. J. Leavitt, Top Down: Why Hierarchies are Here to Stay and how to Manage Them More Effectively, *Harvard Business Press*, 2005, p. 35.

A. Cardona said of this change, “Colleges and universities need to reimagine themselves around inclusivity and student success, not selectivity and reputation.”¹³

Similarly, I propose rethinking the meaning of ‘merit’ in the academy so we can impart greater worth to everyone within the hierarchy. In practice, determination of merit becomes a self reinforcing cycle—what you reward, you get more of. If respect in the hierarchy is only earned through publication, then we get more publication accompanied by a proliferation of predatory publication practices.¹⁴ If contributions essential to your institution’s mission and core values are ignored or devalued, who will engage in the necessary work?

Amartya Sen argues that measuring merit in fixed, absolute terms reflects values and priorities of the past and often comes in conflict with contemporary objectives and views of a good society.¹⁵ To promote mathematics and welcome more practitioners, I ask that we work together to modernize our disciplinary metrics and match merit to mission.

To create improved systems, reimagined around inclusivity and not selectivity, will require hard work. Modernizing disciplinary metrics can impel progress towards diversity, equity, and inclusion; safeguard academic freedom; and support career promotion pathways for non-tenure track faculty. More people might take up the work, if they knew that their contributions would be valued. Change can occur locally at the individual and institutional level or nationally through professional organizations, as evidenced by the partnership between the Carnegie Foundation and the American Council on Education. When you are ready to be part of enacting change, you can find support and resources through associations like AMS or MAA.¹⁶ If you find these resources valuable and you don’t already belong, please consider joining.

¹³K. Mangan, New Carnegie Classification Will Reflect Social and Economic Mobility, *Chronicle of Higher Education*, February 9, 2022.

¹⁴D. S. Chawla, Hundreds of ‘predatory’ journals indexed on leading scholarly database, *Nature*, February 8, 2021, <https://www.nature.com/articles/d41586-021-00239-0>.

¹⁵A. Sen, Merit and Justice, In: K. J. Arrow, et al., *Meritocracy and Economic Inequality*, Princeton: Princeton University Press, 2000.

¹⁶See for instance, the statements and guidelines from the MAA at <https://www.maa.org/programs-and-communities/professional-development/committee-on-faculty-and-departments> or the AMS at <https://www.ams.org/about-us/governance/policy-statements/sec-ams-policystatements>.