

The Tenure Process is an Impediment to the new Citizen Scientists

Dr. Karoline Pershell, Mathematician

Good Morning. I am honored and humbled to be here, so thank you to Vinton, Sigrid and Darshan. Looking at the aggregated wealth of activism and influence in this room, I am mildly confused as to why I am holding the microphone. I would like to use this opportunity to discuss one problem I think we could make progress on, particularly with the background and status of this group.

This issue carries all of the standard caveats:

- This issue is being reported through my lens of experience, which might not match yours.*
- Nothing I mention is an absolute—I am sure you can find counterexamples—but I am identifying trends that address the average.*

What would it mean for the US higher education system to “work.” What would that look like? We should consider this discussion—and a lot would go into it, including the question of whether colleges are trade schools for industry.

(1) I think one conclusion we may come to is that for college to “work” it should mean your degree is “meaningful.” Okay, so what does that mean? We should have a lot of debate, but one of my items (and I have the microphone) is that degree inflation and the associated debt should be scaled back.

(2) I don’t know if others are seeing what I am seeing, but I am finding that the student population we are getting now are not driven by money, but often imagine themselves doing something they love in a niche field that will benefit the world. As professors, I believe it is our unique opportunity if not our duty to direct this altruistic student population, so that they hit the ground running with their degrees, able to move their lives in the direction they want.

(3) We want to teach people how to think about the needs of the world and how the theoretical ideas they are learning can be applied in new and novel ways to solve many of the social ills we see. Societal problems are not neatly packaged, so to do this we will need collaboration and cross disciplinary work. In my limited experience, cross disciplinary work is given a lot of lip service, but is not viable unless your institution has a center designed specifically for cross disciplinary work, because otherwise (1) who funds it, and (2) how do you receive credit in the tenure process for something that is not in your lane?

So how does the bachelor’s degree become meaningful again?

How do we take advantage of this altruistic student population that wants to engage?

We need to teach them how to use their science responsibly (scientific integrity), and that happens when they apply it and see the problems, the discrepancies, and have to tackle issues of time, funds and balancing the needs of disparate groups.

Why do we abandon students right at the time they have to make the moral decisions? We teach them science in the classroom, in undergraduate and grad school, but the first moral dilemmas don’t come about until they are working.

Should we allow students to be coached by their coworkers who also don't have the time to sit and ponder multiple problem trajectories. And you know the pressures of a job means they will be rewarded for getting a project done quickly over thoroughly, cheaply over fairly.

How can we structure the system to still provide the guidance?

We could add these things at the university level. Many in this audience have already found their individual paths that engage students in collaborative community-based efforts that add to the students repertoire, and send the students out to be agents of change once they graduate.

But this happens in isolated pockets. And I would like it to be the norm.

The professor who wants to engage should be given the means and the encouragement to help shape how the students will use science.

Sounds great.

But up until now, this was only possible when you were tenured and had time.

The "publish or perish" system of higher education is flawed. It is inappropriate for smaller schools especially, but with the increase in PhDs, it is one way for institutions to sort the hundreds of candidates for a position. I get it: everyone is busy and hiring mechanisms are faster if we ask: How many publications. In what journals? What's the impact factor?

Hire the one with the highest numbers.

Is that really the right person for the job? And when they land in the job, could that person be expected to engage with students at the level that is needed to create a meaningful degree, let the student hit the ground running, and have the social awareness to engage safely with their science?

For university's whose aim is to turn out thoughtful, engaging empowered students, fast superficial and copious research should not be the guiding principal.

So let me pull this back together:

The tenure metrics are inconsistent with the university's need for engaged faculty. But what we forget are that tenure metrics are a created structure that can be re-made based on the values of a college or university.

They are not an absolute, handed down on stone tablets by the Goddess of Education.

So let us begin with the end in mind: what activities would make faculty positive contributors to the goals of the university? Once these are decided, then we should build a tenure review process that encourages and cultivates the model of engaged faculty.

So what now?

- 1) Sanity check: Should this idea see the light of day? Is this actually a problem, or am I imagining it?
- 2) Create a Foundation: Is there a working group that wants to go forward with prompts for facilitating discussion? Items to be considered are public venues for publication of editorials on this topic.
- 3) Create Dialogue and Refine the Plan: Conduct outreach to professional societies and university groups. Reach out to larger school systems who may not need to adjust their system, but could be proponents of this change for smaller institutions. For example, University of Tennessee at Knoxville may not need to change its tenure system, but does it make sense that the University of Tennessee at Martin also follow the same process?
- 4) Handover Models to colleges and universities: Various frameworks for tenure metrics can serve as a catalyst for discussion at each college or university as they better decide on their mission.

So what? Why did I bring this up to **this** group?

Because I can't do this alone. I alone do not have the credibility because I am no longer in the system. I stepped away from Academia and am not certain if I will go back. I am not certain if it is where I can make a positive difference. So for me alone to complain about the tenure process is just...well...complaining. And who takes that seriously?

Karoline P. Pershell

Before coming to the Foreign Service Institute, Dr. Pershell was an Assistant Professor of Mathematics at the University of Tennessee at Martin. Her research interests include combinatorial methods of understanding Heegaard diagrams for 3-manifolds and geometric group theory. Recently she has been a principal investigator on a National Science Foundation grant through EPSCoRE (Experimental Program to Stimulate Competitive Research), collaborating with a hydrogen fuel cell developer. Karoline was invited to teach summer courses at Qingdao University (2012) and just completed a position as a Fulbright Visiting Lecturer at the University of Hyderabad, India (2013), where she developed and delivered a course for scientists on logic, proof-writing and argumentation.

Karoline was awarded the Diplomacy Fellowship through the American Association for the Advancement of Science and has been at the Foreign Service Institute since November 2013. Dr. Pershell is working on a broad range of issues at FSI, including the collection and analysis of training evaluation data in the School of Language Studies, LGBT issues as they pertain to language, resiliency training, and informal distance learning.

In addition to her mathematical work, she is involved in examining scientists' roles in policy and advocacy, science outreach and integration at the community level, reversible hydrogen fuel cells as an augmentation to solar production, remains active as a curriculum developer with the Fulbright Specialist Program, and is a member of and mentor for EDGE (Enhancing Diversity in Graduate Education), a program aimed at improving retention rates for women and minorities in mathematics. She holds an M.S. and Ph.D. in Theoretical Mathematics from Rice University in Houston, Texas.