Teaching reflections after one year on the tenure-track

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Building Bridges Across Disciplines, Knowledge, and People
SMB Education Subgroup
July 25, 2019
Jumping from a research postdoc to a liberal arts postdoc

- Land-grant/R01
- ~65,000 students
- 1 course in 2015-2018

- Private liberal arts
- ~3,000 undergraduates
- 5 courses in first year
First Year Schedule

Fall 2018
- Calc 1
- Ordinary differential equations

Spring 2019
- Multivariable calc
- Calc 1
- Calc 1
Talk overview

- Influences during this academic year
- Experiences and next directions
Project New Experiences in Teaching (NExT)

Pros:
- 90 fellows and consultants
- Exposure to active learning methods and ways to be more inclusive to all groups
- Classroom management and productivity strategies
- Listserv access

Image: maa.org
Ignatian pedagogy

Concepts that’ve intrigued me:
- Cura personalis
- Agere contra
- Experiential learning
- Discernment

Image: georgetown.edu
Advice around academic community

Ph.D. advisor suggester Table of Contents alerts in grad school; I didn’t listen until this past academic year and it helps!

Dear Reginald McGee,

We are pleased to deliver your requested table of contents alert for Bulletin of Mathematical Biology. Volume 81 Number 6 is now available online.

In this issue

Lesion Dynamics Under Varying Paracrine PDGF Signaling in Brain Tissue
Susan Christine Massey, Andrea Hawkins-Daarud, Jill Gallaher, Alexander R. A. Anderson, Peter Canoll & Kristin R. Swanson

» Abstract » Full text PDF

Asymptotic State of a Two-Patch System with Infinite Diffusion
Yuanshi Wang

» Abstract » Full text PDF
Advice around academic community

Discussed:
- Examples from other’s tenure track experiences:
  - Overprepping
  - Reality time mapping
  - Sunday meetings
  - Navigating department cultures
- A lot of overlap with NCFDD

Image: rienner.com
Advice around academic community

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- Examples from other’s tenure track experiences:
- Overprepping
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- Sunday meetings
- Navigating department cultures
- A lot of overlap with NCFDD

Favorite takeaway: Career is a book and tenure track is just one chapter - you don’t have to do everything right now
**Scenario:** Before classes start

**Intention:** Take ODE students into the computer lab
Pre-semester programming survey

How would you rate your programming skills?

18 responses

1: 5 (27.8%)
2: 8 (44.4%)
3: 2 (11.1%)
4: 1 (5.6%)
5: 2 (11.1%)
6: 0 (0%)
7: 0 (0%)
Pre-semester programming survey

What programming languages and software have you used for math purposes?

18 responses

- C/C++: 0 (0%)
- dfield/pplane: 0 (0%)
- Fortran: 0 (0%)
- Maple: 11 (61.1%)
- Mathematica: 2 (11.1%)
- Matlab/Octave: 12 (66.7%)
- Python: 1 (5.6%)
- R: 4 (22.2%)
- Sage: 0 (0%)
- xpp: 0 (0%)
- None of the above: 2 (11.1%)
- Java: 1 (5.6%)
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None of the above: 2 (11.1%)
Java: 1 (5.6%)

New goal: Teach Matlab in all my courses, build a departmental code repository
Scenario: First day of classes

Intention: Wow and convince them Calc will be the coolest
Candy bar activity

Before the syllabus activity.
Wanted to show:

- Group work will be apart of this course
- Participation will be expected
- Functions are everywhere and they vary and need to be studied
Candy bar activity

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- Functions are everywhere and they vary and need to be studied

New goal: Live plotting of their responses
**Scenario:** 3/4 through the semester and I’m behind...

**Intention:** If they read before lecture I can move faster during class
Note guide flips

Idea via NExTer Diana Schepens, Ph.D., Whitworth University

7. If we know that it’s raining outside, then we know that it’s wet outside. But if we know that it’s wet outside, does that mean we know that it’s raining?

8. How is the above statement similar to Fermat’s Theorem?

9. Rewrite the contents of the blue box on pg. 203.

10. Why does the author only check the values $x = 0, 1, 4, 6$ in Example 3?
Note guide flips

Aims:
- Get students to open the book
- Prime students for lecture
- Point out nuance of examples
- Encourage them the look at figures and margins

Required submission before class to discourage procrastination
12. Survey: Did you find this guide helpful? What did you like about the guide? What did you not like about the guide?

This guide was helpful, because I generally come into lectures with absolutely no understanding of what it will be on, but now I will come in knowing the basics.
12. very helpful, I never read the marginal details but this pointed out how useful they can be. Likes everything
I'm a fan of this. The textbook can be really overwhelming and most of the things we focused on I wouldn't have looked at with direction. Although I found it more helpful to write definitions in my own words rather than directly copy it, but that's not universal.
12. Survey: Did you find this guide helpful? What did you like about the guide? What did you not like about the guide?

Somewhat restructuring was a positive. Maybe more questions.
12. Survey: Did you find this guide helpful? What did you like about the guide? What did you not like about the guide?

yes. it was not too long, but still made me effectively preview the material. Maybe more practice examples would be better.
Student attitudinal survey

12. Survey: Did you find this guide helpful? What did you like about the guide? What did you not like about the guide?

Yes, it was not too long, but still made me effectively preview the material. Maybe more practice examples would be better.

New goal: Intend to use note guides for each section of the first chapter (pre calc review) of the Calc 1 textbook
Scenario: Email arrives about Faculty Think Tank series
Intention: Attend, shadow senior liberal arts profs, get free lunch
Post exam reflections

**Aim:** Help students on lower end of distribution of exam 1 in Calc instead of supplementary problems or redo and regrade

1. For each exam question, write a brief response on any errors made in your solution and/or a different approach you might now use to solve the problem (2-3 sentences), and how might you better organize and narrate your solution (1-2 sentences). Number each response.
Post exam reflections

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**Outcome:** Joined Holy Cross Writing Across the Curriculum
Colloquium reflections

**Aim:** Incentivize colloquium attendance

1. Write a brief response (4-5 sentences) on how you felt about the talk both mathematically and stylistically. Describe both portions of the talk that you enjoyed, that interested you, or that inspired you during the talk and things that were not clear to you or that you did not enjoy. Moreover, describe stylistic points about the presentation (slide layouts, color choices, titles, graphics, etc.) that you felt were conducive to understanding the talk or that you felt hindered your understanding of the talk.
Colloquium reflections

Pros:
- Started as only local colloquiums
- Expanded for students who might not be able to attend
- Received some unexpectedly thoughtful responses

Francis Su’s MAA President Retiring Address
(Image: Yale University Press)
One part of the talk I really enjoyed was when Francis Su got into race and sexism in mathematics. I really enjoyed this part because I feel like the reason there is a shortage of women and people of color in mathematical and scientific fields is because of all the stereotypes society has put on them so I like how he took the time to address the issue and try to show people how to make a change. I also liked that he talks about how some professors tell students to switch out of the math major instead of providing them with the skills they need to be successful. I liked this because it brings up this idea that sometimes students don’t fail because they are lazy or don’t try hard enough but sometimes the professor makes all the difference of who that student turns out to be. One thing I disliked was that he kept reading from the Ipad. I felt like this disconnected him from the audience a little, however his speech was overall funny yet insightful and had me thinking of math through a philosophical lense.
I listened to the talk from Francis Su, head of the Mathematical Association of America. I enjoyed the content of his talk and most connected with the introduction of his presentation. The stigma surrounding math and taking higher math courses is apparent. Personally being an athlete in high school, many of my fellow classmates thought less of me academically. It was hard to find a partner to work with on group work, they thought wasn’t going to be able to contribute because of this stigma. So when Francis Su spoke about Christopher in prison, obviously a more serious situation, I felt like I could see where’s he’s coming from. A relationship can built with mathematics through anybody. I felt like in his presentation, though, he could have used more of the screen he was provided. He had a sufficient powerpoint, but I personally like to use video clips or first hand examples in my presentations. It keeps the audience glued. Standing on the stage alone and lecturing can often be tedious and lose the audience's attention.
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**New goal:** Incorporate assignment into all 200/300 level courses
Summary

Some goals moving forward:

- More writing in my courses
- Participating in the Holy Cross WAC
- Live plotting of responses
- Want to start a journal club / reading group and eventually take self-motivated students on in summer
- Work more on Matlab materials for Calc 3 and other courses
- More attitudinal surveys, how to share these results
Acknowledgements

Thanks to:

- Carrie Diaz Eaton, Ph.D., and the SMB Education Subgroup
- Holy Cross Community
- Project NExT Community
- My math tribe broadly
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We’re hiring (in geometry)!

Thanks for listening!
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