So You Want To Be A Professor?

Professor Kenneth S. Suslick

School of Chemical Sciences
University of Illinois at Urbana-Champaign
www.scs.uiuc.edu/suslick/seminar/sonseminars.html

- Managing & Coping
- The Application Process (in the sciences and engineering)
- Planning & Organization
- Presenting

Caveats

- Do as I say, not as I do.
  This presentation represents what I would like to be to do, not necessarily what I actually do!

- De gustibus non disputandum est. (*There is no arguing about tastes.*)
  These are my opinions.
  I could be wrong, but I'm not.

- Snepscheut’s Law:
  In theory, there is no difference between theory and practice.
  But in practice, there is.

- Monk’s Commentary:
  You’ll thank me later.
The Human Tragedy
Graph #1: Coping with Stress

*There ain’t no such thing as a free lunch. – R. Heinlein

Managing Stress

- Initiative vs. Finishitive: starting is hard, finishing is harder.
- Tricks for starting: do something, anything; just type, do your favorite part, futz with format, …
- Distractions are tempting due to rate of change. We’re much more sensitive to slope than position.
- Finishing. “An artist needs two assistants: one to help create, the other to stop him when he’s done.” – W. Churchill
Managing Time

- If it isn’t worth doing, it isn’t worth doing right! – KSS
- Write it down and the list will remember for you.
- Complex jobs are done one bite at a time: Compartmentalize into small tasks. Even 15 min. can get a bite done.
- Enjoy what you are doing! (well, mostly anyway…) Do the crappy jobs first thing and quickly.
- Last daily chore: 5 min. to plan tomorrow’s day.

Human Tragedy Graph #2: Managing Rewards

Satisfaction = \frac{d(\text{progress})}{dt}

Approach Avoidance: the last 10%
Managing Decisions

The Human Tragedy

Graph #3: Reality of choices

The Professor

• Did you ever wonder what Full Professors were actually full of?

• Faculty are M&M’s:
  Hard outer shell, soft interior.
  Inside they’re mostly shy, insecure, scared little kids.

  (Yeah, hard to believe, but think about it: it will explain much of our behavior!)
The Professor

• Why do we do what we do?
• Faculty are exceedingly curious: Discovery is not “Eureka”, but “That’s odd…”
• Faculty are ‘maladjusted’. They try to adjust the world to them, not themselves to the world.
• Faculty are borderline obsessive-compulsive: i.e., control freaks.

The Professor

• Why do we really do what we do?
• Faculty are driven by ego, not $. Pecking order among peers (world-wide & local), not fame per se with the public.
• Intellectual dare-devils; BUT personally risk-averse.
• Tenure is stability in exchange for salary (remember, scared little kid…).
What Do Faculty Do?

A Professor has 5 jobs:

- **Teaching** (classes, mentoring, advising)
- **Research Mentoring** (graduate students, papers, theses)
- **Service** (committees, reviews, editorships)
- **Entrepreneurship** (consulting, start-ups)
- **Fundraising** (needed to support all of the above) (aka: ‘Grantsmanship’)

Professorial Roles: Mentoring

- In sciences, research = graduate education
- Symbiotic: Last Great Medieval Apprenticeship
- Students work WITH the prof., not FOR the prof.
- Invoke their passion for research
  - Undergrad: learning that which is known.
  - Graduate: learning that which no one knows!
- Mentoring student growth is rewarding in the same way that parenting is, and frustrating in the same way that parenting is!
So, you still want to be a Professor?!

The Assistant Professor Application Process

- Universities solicit applications.
  Must be advertised for legal reasons.
- Applications come in from around the world.
  >100 applications per faculty position.
  At UIUC – maybe 10 are good enough to be faculty here.
- Triage process: Eliminate all but 10 or so.
- Jaundiced reading of outside letters.
- Decision who to invite based on CV (i.e., productivity), letters, research props, intangibles (e.g., fit, mentors…)

The Triage Process

- Personal connections – do they know your research advisor and like his/her work?
- Publication count.
- Prestige of the journals of your papers.
- Research area; is it exciting; does it fit into where the department sees itself going?
- Teaching: are you serious about being faculty.
- Does the university have the resources for you to do the work?
- Demographics.
**Things To Increase Your Chances**

- Try to make the personal connections long before your cover letter.
  - Go out of your way to meet the dept head and relevant faculty of target schools at national meetings.
  - A year before you apply, be sending out reprints to faculty that overlap closely with your work.

- Increase your chances by putting a personal touch into your cover letter.
  - It was nice meeting you at ....
  - Professor X, Y, Z recommended that I write to you
  - Praise the people at the University and tell how you fit in

- Ask your research advisor for advice.

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**There Are Many Qualified Candidates**

- Many qualified people will not get an invitation.
- The only solution is to blanket the nation with applications.
- Once a letter has been written, sending it to many is not a problem.
- Pick and choose after you get interviews.
The Research Proposals For A Faculty Job

- **Big picture:**
  - What is the area that you want to work in?
  - What are the key questions in that area?
  - What special expertise do you bring to the table?
  - How will you be a leader in that area?

- **The first big question that you wish to address.**
  - Why is this question important.
  - Overview of how will you address it.
  - 3 Specific Proposals, typically.
  - 5 pages each, including background and refs.

- **Who will pay for it?**

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The Hourglass Picture Of Research

Start with an important area!

Describe an important big question in that area that you can use to build your career.

Focus to solvable question.

- Observables?
- Data Analysis?
- Reach conclusions.

Generalize back to big problem!
Proposal Evaluation Criteria

- What are you trying to do?
  State your objectives using absolutely no jargon.
  If you cannot explain it simply, you are not going to get a job.
- Who will care?
  If you're successful, what difference will it make?
- What's new in your approach?
- Why do you think it will be successful?
- What special skills do you bring to the question?
- How much will it cost, how long will it take?

Proposal Evaluation Criteria

- If you do what you propose, will you get tenure?
  Faculty generally assume that candidates will only do half of what they propose, if they’re lucky!
- Can you do it?
  In your existing work, have you demonstrated the brains and the drive you need for success?
- How well will the work fit into the department?
More Than Just a Proposal

- You need a career plan, not just a research proposal.
  People are judging whether they should hire you as a colleague:
  Is your area exciting enough to sustain a career?
  Do you have plans beyond the start-up of a lab?

- Indicate that your goal is to become a leader in an area and here is how you will do it.
  Rather than saying, “Here is a piece of work that I want to do.”

The Interview

- Everything changes in the interview.
  If you get to the interview, your previous work has been judged as being good enough:
  BUT you can still convince them otherwise!!

- Interviews are focused on the future not the past.
  The quality of your research ideas.
  Whether you can communicate/teach.
  Whether you demonstrate drive and enthusiasm you need to succeed.
  Whether you can fund your work.
Preparation For The Interview

- You need
  A 5, 15, and 50 minute description of what you have done.
  A 5, 15 and 50 minute description of what you are planning to do.
  A 5 minute contingency talk on alternatives you would try if your initial experiments do not work.
  A 3 minute blurb on every technique you are planning to use.
  A 5 and 15 minute description of your teaching: what, how, why.
  A 5 minute description of what you need to get started: equipment, students, space.
  A 5 minute sales pitch of how you will fund your work

- You also need to know who you are likely to collaborate with at the university or outside.

The 5 Minute Research Description

- Define the problem:
  What is the area (1 sentence).
  Mention why it is important.
  What is the first key question to address – this should be one specific aim from your prop.
  Explain how that fits into the big problem.

- What has been done before (< 4 sentences).

- What are you going to do that is new? i.e., how is it different than things that were done before.

- Preliminary results (< 2 sentences).
The 15 Minute Research Description for Each Proposal

- Define the problem:
  What is the area (1 sentence).
  Why it is important.

- **What is the first key question to address** –
  this should be one specific aim from your prop.

  Two other specific aims from your prop.
  Explain how they fit into the big problem.

- What has been done before (< 4 sentences).

- What are you going to do that is new?
  i.e., how is it different than things
  that were done before.

- Preliminary results (< 2 sentences).

Planning the Organization of the Talk

- You are **telling a story**.
  Tell it so they understand.

- Graphics & figures first, then words.
  Easier to organize your talk.

- Verbal comprehension is limited:
  Tell them what you are going to tell them,
  then tell them,
  then tell them what you told them.
Acknowledgments and Ending

- Note American spelling of “acknowledgments”.
- Make it brief and to the point:
  Thanks to R. Masel for his thoughts on this topic, and P. Darrow for illustrations.
- Let the audience know when you are done!
  Best closing line:
  “And finally, I’d like to thank you for your very kind attention.”

( Then, shut up and wait for the applause! )