

A Successful Faculty Member: Essential Components

For PhD Students, Postdocs and New & Old Faculty Members

Nuts and Bolts

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January 12, 2011

ISED 2010

NJIT

Outline

- *World Class Universities*
- *Experience of Graduate Student Career*
- *As a Faculty*
 - *Beginning*
 - *Managing Time*
 - *Managing Teaching*
 - *Research*
 - *etc etc.....*
- *Conclusions*



❑ India needs about 600 universities and 35,000 more colleges over the 12 years to enroll even 30 percent of its potential students: Human Resource Development Minister Kapil Sibal.

❑ Indian institutes like the IIMs and IITs are the top notch schools in the country but have limited seats. The entry of foreign universities is expected to ease this crunch a little bit.

What the World Class Universities do?

**Institute—highly Sought-after Graduates
Cutting-edge Research
Dynamic Technology Transfer**

Dynamic Interaction

- A high concentration of talent (students and faculty)
- Abundant resources (financial and educational)
- Favorable governance (supportive regulatory framework, autonomy, leadership, academic freedom)

FACULTY & STUDENT PROFILES MAKE THE DIFFERENCE

Experience of Graduate Student

HOW TO HAVE A BAD GRADUATE CAREER.....

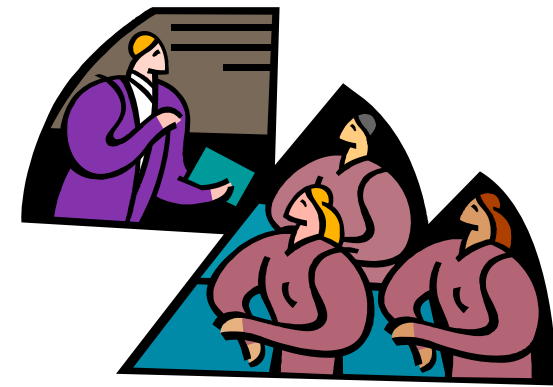
- **Concentrate on getting good grades**
 - postpone research involvement: might lower GPA
- **Minimize number and flavors of courses**
 - Why take advantage of a wide range of excellent grad courses
 - May affect GPA
- **Don't trust your advisor**
 - Advisor is only interested in his or her own career, not yours
- **Only work the number of hours per week you are paid!**
 - Even less if possible...
 - Don't let master class exploit the workers!
- **Don't waste time polishing writing or talks**
 - Again, that takes time

HOW TO HAVE A BAD GRADUATE CAREER.....continues

- **Concentrate on graduating as fast as possible**
 - Winner is first in class to Ph.D.
 - People only care about that you have a Ph.D. and your GPA, not on what you know
 - Don't spend a summer in industry: takes longer
 - » How could industry experience help with selecting Ph.D. topic?
 - Don't work on large projects: takes longer
 - » Have to talk to others, have to learn different areas
- **Don't go to conferences**
 - It costs money and takes time; you'll have plenty of time to learn the field after graduating
- **Never read on your own**
 - What's the advisor for if you have to pick your own readings?
 - May lead to extra work, interaction with others, ...
- **Don't worry at all about research funding**
 - It's your advisor's job to keep you "in the money"
 - Why waste any time with proposals, fellowship applications, etc?

Why Become a Faculty Member?

- We can do whatever kind of research we want to do and have the opportunity to work with bright young people year after year.
- We tend to have fairly flexible schedules so we can do a lot of interesting things, and **you know—that's a fantastic job.**



Advantages



● Rewarding Profession

- Get to share your knowledge and insights with students and change the lives of some.

● Meaningful work

- Lot more meaningful than making a corporation richer

● Use your mind every single day: *ideas*

● A flexible schedule

● Travel!

● Summer break and Sabbatical

● Fabulous people

● Job security



Common Mistakes for New Faculty



OOPS!

- ✗ Spend a lot of time in Teaching
- ✗ Overprepared with more material than they could reasonably cover in the allotted time
- ✗ How to deal with bored classes and poor student performance
- ✗ Set aside only few hours in a week for writing papers: i.e. spent far less time on scholarly writing
- ✗ No knowledge of how to write a successful proposal for funding.
- ✗ Sit through endless departmental faculty and committee meetings
- ✗ Never receive guidance on how to be a faculty member, and takes years to figure it out by trial-and-error

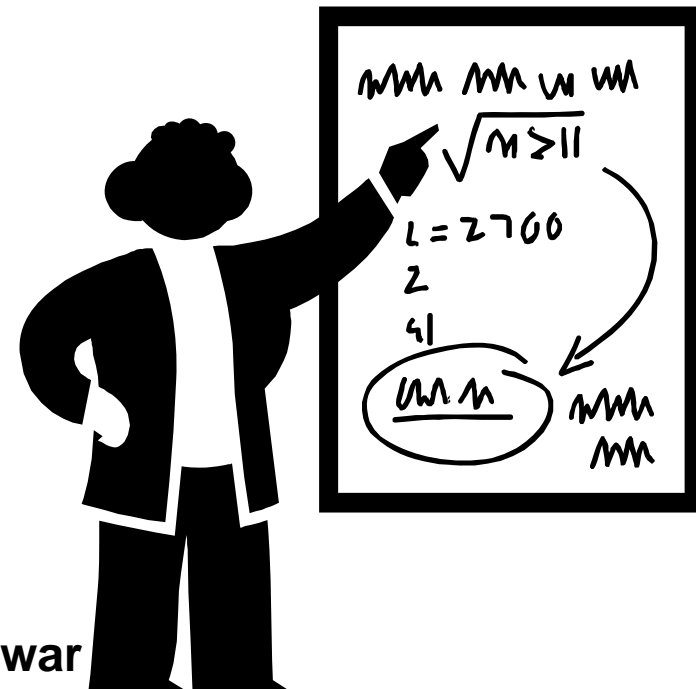
In the Beginning.....



- ☀ Introduce yourself to the departmental secretary, administrative assistant, and services staff and develop a good relationship
- ☀ If you plan to have a lab, have a frequent liaison with departmental/Institute workshops
- ☀ Be courteous to everyone around you.
- ☀ Attend all the social functions in your Department. Isolation is often cited as a common problem for new faculty.

What is Important?

- **Research**
 - Scholarship, Publication etc
- **Grants & Funding**
 - Money Talks
- **Teaching**
 - Can make life tough
- **Service**
 - Required



FACULTY SKILLS



- Write well, speak well, and interact with people well.
- Organization and Multitasking
- Keen business sense and can manage budgets, projects, and people. learn about budgeting, and mapping out a projected budget of what everything is going to cost
- Must be fiercely independent, yet able to collaborate well with others.
- Must be confident enough to know that you've found a scientific truth, but humble enough to admit when are wrong.
- Kind enough to mentor younger scientists, but tough enough with their time to be able to manage it well.

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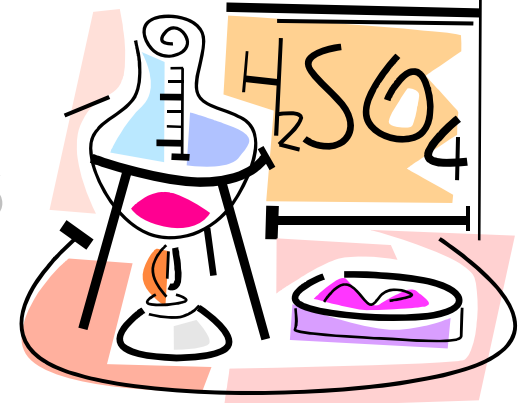
STEP 1 RESEARCH



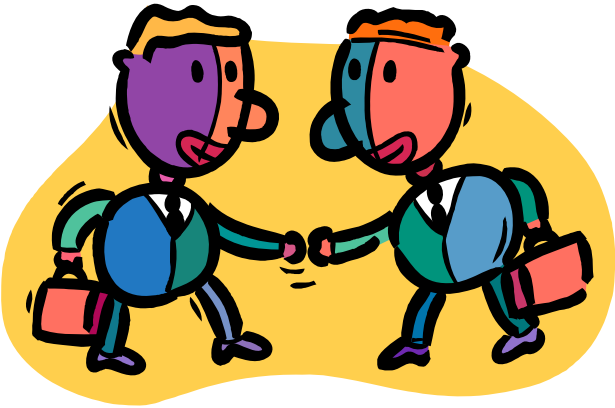
- Unique niche in research
- Significant body of work (peer-reviewed publications)
- Hit the home run –singular achievement
- Demonstrated impact of research
- Visibility (invited talks, discussion at conferences)



RESEARCH - tips

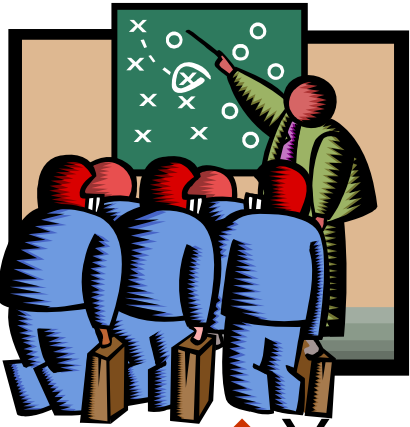


- Spend 30-60 minutes a day on scholarly writing.
- Keep your nose to the keyboard and **write, write, write.**
- Keep your manuscripts in the mail, not on the desk.
- Use whatever resources are available to advance your research, within the bounds of law, ethics and courtesy.
- Avoid too many uncorrelated research pursuits; become thematic.



Collaboration

- Establish collaborations with other researchers and learning to depend on the help of others
- Never be afraid about hiring or collaborating with somebody who is smarter
- Extend out of the university and into other labs and institutions to provide a fresh perspective
- Volunteering to give a seminar is one way to introduce other people to your areas of expertise.



People Management

- ❖ You have to be explicit about your expectations; if you plan on working 15 hours a day in the beginning, then you want a lab staff that will be willing to match that lifestyle
- ❖ If you want people to work evenings and weekends, then you will have to show up as well i.e. work side by side with the students
- ❖ Independent thinkers: You also have to learn to let go and let people make mistakes OR They're going to develop more of a 'technician' mentality."

More on People Management



- ❖ Be available! (Open door policy)
- ❖ Each student is different, must figure out how to motivate them
- ❖ All go through a learning curve, be patient!
- ❖ Give each student a project they can “own”, yet enough overlap with others in the group so they don’t feel isolated
- ❖ Hold weekly formal group meetings where students get practice presenting their research, a few times per year
- ❖ Hold weekly informal subgroup meetings where each student reports on previous week’s progress and plans for the next week
- ❖ Keep them writing, so they don’t leave it all for the end
- ❖ Output full-fledged researchers who can: **define a problem, a solution strategy, execute the strategy, analyze the data, write a great first draft, give an excellent talk**



STEP 2

Grants & Funding

- Alternate funding sources such as various foundations, nonprofits or industry in addition to DST or AICTE
- Think outside the box when it comes to defining your research. "One has to be opportunistic.
- The most important aspect for getting funding is putting together a well-thought-out proposal.
- Wait to get results that are sufficiently compelling and provocative, and are likely to get the attention

FUNDING AGENCIES

Agency Code	Name of Agency
DST	<u>Department of Science & Technology</u>
DBT	<u>Department of Biotechnology</u>
DAE	<u>Department of Atomic Energy</u>
DE	<u>Department of Environment</u>
DM	<u>Department of Mines</u>
MHRD	<u>Ministry of Human Resource Develop</u>
IGCAR	<u>Indira Gandhi Centre for Atomic Research</u>
ISRO	<u>Indian Space Research Organisation</u>
DIT	<u>Department of Information Technology</u>
MNES	<u>Ministry of Non-Conventional Energy Sources</u>
VSSC	<u>Vikram Sarabhai Space Centre</u>
CPRI	<u>Central Power Research Institute</u>
ADA	<u>Aeronautical Development Agency</u>
DRDO	<u>Defence Research & Development Organization</u>
ARB	<u>Armament Research Board</u>
NRB	<u>Naval Research Board</u>
ARDB	<u>Aeronautics Research & Development Board</u>

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http://www.jisc.ernet.in/content_fundingagencies.html
ISED 2010 Bhubaneswar



Process to get a Grant

- Visit agencies (DST or DoD) to float ideas
- Full proposals (intro: motivation/goals; background: prior research in field, your expertise; proposed research; expected impact)
- Learn about a reasonable budget
- Interdisciplinary proposals –find the right home within the agency, construct the right team

STEP 3

Teaching

Basic Students Skills

In

A Knowledge Economy

- ❑ The ability to do critical thinking and problem-solving
- ❑ The ability to communicate effectively
- ❑ The ability to collaborate





Engineering Innovation

- How
 - Scholarly and systematic engineering educational innovation based on a **continual cycle of educational practice and research**
- Who
 - **The responsibility** for the quality of the engineering educational experience **rests with the engineering faculty and administrators.**
- What
 - Three elements, and their alignment, are central to an effective educational environment: **curriculum, instruction, and assessment.**

Creating a Culture for Scholarly and Systematic Innovation in Engineering Education

January 12, 2011

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Engineering faculty must lead in creating and sustaining a culture of scholarly and systematic educational innovation. However, they must also be empowered, supported, and rewarded.

Enhancing Engineering Education

Mentoring Closely:

- Faculty members implicitly define mentoring by their own personal experience
- Desired mentoring outcomes vary depending upon individuals' need
- Faculty have legitimate concerns about being asked to do more mentoring

In a perfect world.....

- Undergraduate research activities
- Intensive, small group project work

.... Great, but only reach a small percentage of the population:

- Not enough faculty, space, time, research projects to include all, or even most, students
- Many undergraduate students don't have time or interest to engage



Teaching

- Understand from others what the best teaching styles are. "Try to convey your information as clearly and as simply as possible but engage your students—get students to help themselves learn, and give them opportunities to speak to you.
- Lecture at a pace that allowed for active student participation.
- Teaching and research are intimately intertwined
- Involve undergraduates in your research
- If you're a good researcher and you don't know how to communicate those results, you're not going to be very effective.



Teaching

- ➡ Limit classroom preparation to a maximum of two hours per hour of lecture
- ➡ Spend at least 2 hours a week on discussions with colleagues focused on teaching and research
- ➡ Find a Master Teacher and learn to deal with teaching
- ➡ Self-monitor how well you are meeting Commitments
- ➡ Integrate research interests into lectures



Teaching - tips

- ▶ Students shouldn't be left guessing what you expect of them
- ▶ Facilitate high-tech adaptations for course materials: course website
- ▶ Take a deep breath and relax before you start class (avoid arriving in class hurried, irritable or out of breath)
- ▶ Be comfortable and have fun (students will feel it)
- ▶ If you ask: Do you have any feedback? Answer: NO
- ▶ Ask "List three things that are going well in this class, and three things you'd change if you could."
- ▶ Don't sweat the little stuff, and that includes hearing isolated complaints from individual students

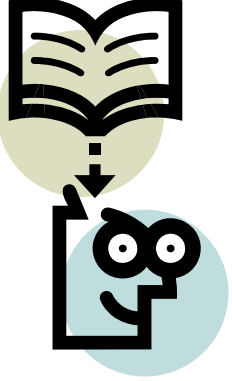


STEP 4

Service



- Be assertive about seeking out opportunities for yourself
 - Reviewing Papers - Organizing Conferences
- Careful about taking on too many administrative duties that would interfere with research and teaching duties
- Except those you think would be fun to do and that would directly benefit your career and your research, such as participating in grant reviews



Service



- ❑ Serve on university committees (not as a committee chair)
 - ❑ You may find a Mentor
 - ❑ Meeting colleagues from a wide variety of disciplines from across campus

Politics



- ④ In academic circles, good science always wins, not politics
- ④ Playing politics is potentially damaging.
- ④ Focus on your scientific teaching, avoid politics in any way—only people who can't do science play that game
- ④ Playing only politics is the way to get ahead: It never works

Precautions



- ◆ Over Commitment
 - ◆ Can not deliver in time
- ◆ Incorrect Expenditure
 - ◆ May end up paying from pocket
- ◆ DATA Falsification
 - ◆ Severe Consequences
- ◆ Plagiarism
 - ◆ Reputation
- ◆ Avoid criticizing anyone publicly or privately.



SUMMARY

- Importance of setting goals
- Keep the letters of thanks and supportive memos. Copy particularly noteworthy items to the Head, as they are received.
- Achieving balance between work and personal life
- Don't forget to take the time to enjoy yourself
- Avoid trying to change the world (dept.) in one day.
- Avoid getting too depressed if things do not work out- just look around you,
- Attend a professional development and/or teaching workshop, talking to colleagues and finding a mentor
- **Keep on smiling because others have made it and you probably will, too.**

Thank You



More Information

Robert Boice, *The New Faculty Member*, San Francisco, Jossey-Bass (1992). For additional discussions of problems faced by new faculty members and ways their departments can support them, see the Random Thoughts columns "[Teaching Teachers to Teach: The Case for Mentoring](#)," and "[Things I Wish They Had Told Me](#)."