Developing a Research Plan

Dr. Benjamin C. Flores
Dean
The Graduate School
Fall 2013
Get to know each other

- Letter Exercise
- Pick a letter from the alphabet
- Find three words that start with the letter that describe you:
  - Independent
  - Innovator
  - Irresistible
- Share with peers around the table
The word "thesis" comes from the Greek θέσι, meaning "position", and refers to an intellectual proposition.

"Dissertation" comes from the Latin dissertātiō, meaning "discourse."

**Thesis or Dissertation?**
• Settle on a research field
• Seek an advisor
  ◦ Let the advisor find you
• Seek sources of funding
  ◦ Start up funds
  ◦ Scholarships/Fellowships
  ◦ RAs
  ◦ Wrap up funds

It’s Never to Early to Start
FIND A MENTOR

Learn from someone who wants to make you big!
A thesis or dissertation committee is a committee that supervises a student's dissertation.

This committee, consisting of a primary supervisor or advisor and two or more committee members, supervises the progress of the dissertation and may also act as the examining committee, or jury, at the oral examination of the thesis.

The committee is chosen by the student in conjunction with his or her primary adviser, usually before completion of the comprehensive examinations.

The committee members are doctors in their field (whether a PhD or other designation) and have the task of reading the dissertation, making suggestions for changes and improvements, and sitting in on the defense.

At least one member of the committee must be a professor in a department that is different from that of the student.
Who’s Who in Your Committee?

- Advisor (Chair)
- Committee Members
  1
  2
  3
- External Committee Member(s)
  1
  2
What is the Committee’s Function?

“Doing the right thing”

- Determine the research topic
- Create structure and clarifying expectations
- Approve final defense
The research plan serves very important functions:

- It contributes to your development as an investigator
- It’s a map for your dissertation
- It demonstrates your intellectual vision and aspirations
- It's also an opportunity to begin to demonstrate the creative and independent thinking required of a successful research professional

http://sciencecareers.sciencemag.org/career_development/
GET ORGANIZED

Don't waste your time on your own messes every day.
First Good Impressions

- Keep it short
- Write it carefully
- Include an executive summary
- Pay attention to the layout
- Use good graphics
- Focus on the work, not yourself
- Avoid obvious mistakes
- Avoid obvious hype
• Assume you are what you do
• Say it in 1 minute (150 to 200 words)
• Use active verbs
• Describe the big picture
• Smile – be pleasant

What’s Your Elevator Speech?
Outline of a Plan

- Goal
- Hypotheses/Research Questions
- Keywords
- Background (References)
- Significance
- Research Method (Design)

http://www.utexas.edu/academic/ctl/assessment/iar/research/plan/
• A goal is an overarching principle that guides decision making
• Objectives are specific, measurable steps that can be taken to meet the goal

S Specific
M Measurable
A Attainable
R Relevant
T Time-bound

Goals or Objectives?
1. Goals are ________
2. Goals are general
3. Goals are sometimes ________
4. Goals are abstract
5. Goals are generally difficult to ________

1. Objectives are narrow
2. Objectives are ________
3. Objectives are tangible
4. Objectives are ________
5. Objectives are measurable

Goals v. Objectives
Goal

- Objective 1
- Objective 2

Goal and Objectives
<table>
<thead>
<tr>
<th>Literature Review</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Finding</td>
</tr>
<tr>
<td>Second Finding</td>
</tr>
</tbody>
</table>
READ MORE

Knowledge is power.
<table>
<thead>
<tr>
<th>Hypothesis I</th>
<th>Method of Analysis I</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypothesis II</td>
<td>Method of Analysis II</td>
</tr>
</tbody>
</table>

• Analysis/Synthesis
  ◦ One method per hypothesis
• Compliance
  ◦ Protect Human Subjects
  ◦ Adhere to Animal Welfare Regulations
• Timeline
• Evaluation
• Limitations
• Anticipated Results
• Future Work
"Fascinating! So that's why chocolate-chip cookie dough tastes better raw!"
<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>Ability to recall previously learned material.</td>
</tr>
<tr>
<td>Comprehension</td>
<td>Ability to grasp meaning, explain, restate ideas.</td>
</tr>
<tr>
<td>Application</td>
<td>Ability to use learned material in new situations.</td>
</tr>
<tr>
<td>Analysis</td>
<td>Ability to separate material into component parts and show relationships between parts.</td>
</tr>
<tr>
<td>Synthesis</td>
<td>Ability to put together the separate ideas to form new whole, establish new relationships.</td>
</tr>
<tr>
<td>Evaluation</td>
<td>Ability to judge the worth of material against stated criteria</td>
</tr>
</tbody>
</table>
• Intellectual Merit
  ◦ Why is it necessary?
  ◦ Does it fill a gap in the literature?
  ◦ Does it advance discovery?
  ◦ Is it potentially transformative?

• Broader Impacts
  ◦ Who will benefit and how?
  ◦ How will you communicate your research findings?
  ◦ How will you make sure the public has access and can understand your findings?
Photochemical synthesis of glycopeptides and peptide thioesters

Katja Michael, The University of Texas at El Paso

“The P.I. endeavors a novel and broadly applicable, photochemical approach to make these important peptide derivatives better accessible to the scientific community. Developing novel methods for the efficient synthesis of thioester peptides and glycopeptides has cross-disciplinary implications. Not only does it expand the synthetic methodologies available to organic chemists, but biophysicists, glycobiologists, spectroscopists, and pharmacologists will also benefit from the improved accessibility of pure, homogeneous glycoproteins in large quantities.”

Intellectual Merit
• **Offering** national or international **summer research or outreach programs** for middle and high school students, high school teachers, or undergraduate students including many from underrepresented groups.

• **Organizing national and international workshops** or symposia for faculty or students.

• **Training and mentoring students** to be future professionals.
• Strengthening the chemical workforce through curriculum development.

• **Increasing the number of women and minority** chemists in tenured academic positions in research universities.

• Updating curriculum by **writing texts or developing new classroom instructional materials and laboratory experiments**.

• **Mentoring junior faculty**.
Gantt Chart

- Activities
- Periods
- Milestones

http://www.vertex42.com/ExcelTemplates/
<table>
<thead>
<tr>
<th>Objective /Activity</th>
<th>January</th>
<th>February</th>
<th>March</th>
<th>April</th>
<th>May</th>
<th>June</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
I USED TO HATE WRITING ASSIGNMENTS, BUT NOW I ENJOY THEM.

I REALIZED THAT THE PURPOSE OF WRITING IS TO INFLATE WEEK IDEAS, OBSCURE POOR REASONING, AND INHIBIT CLARITY.

WITH A LITTLE PRACTICE, WRITING CAN BE AN INTIMIDATING AND IMPENETRABLE FOG. WANT TO SEE MY BOOK REPORT?

"THE DYNAMICS OF INTERBEING AND MONOLOGICAL IMPERATIVES IN DICK AND JANE: A STUDY IN PSYCHIC TRANSDISTRIBUTION GENDER MODES."

ACADEMIA, HERE I COME!
Manage Time
- Differentiate between the urgent and the important.
- Write 15–30 minutes daily.
- Keep records of writing daily; share your records weekly.

Write
- Write from the first day of your research project.
- Post your thesis on the wall and write to it.

Revise
- Organize around key sentences.
- Use your key sentences as an after-the-fact outline.

Get Help
- Share early drafts with non-experts and later drafts with experts.
- Learn how to listen.
- Respond to each specific comment.

Polish and Publish
- Read your prose out loud.
- Kick it out the door, and make ’em say, “No.”

http://www.taragray.com/workshops/publish.html
DO IT WELL
Whatever you do, do your best.