Unleashed Tips for Successful Graduate Life in Engineering:
How to live an academically efficient life by not doing unimportant things

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CEE 691 Seminar
Civil and Environmental Engineering
University of Hawaii at Manoa
1 Introduction
   • Overview
   • Define yourself

2 How to reach your academic goals?
   • Basic skills for all the engineering students
   • Faculty-defined best graduating student

3 Your success is nothing but your publications
   • Academic success

4 Concluding Remarks
   • Random advises
   • Information to be updated
   • Summary

5 Acknowledgment
   • Thank You
Graduate degree? What is it?

1. Undergraduate degrees
   - 2 year college: Associate of Science (AS)
   - immediate specific jobs
   - 4 year college: Bachelor of Science (BS)
     - expanded job opportunities in various fields
     - qualification of graduate study

2. Graduate degrees
   - Masters: Master of Science (BS)
     - plan A: coursework + thesis
     - plan B: coursework + coursework + report
     - Fast Track: BS+MS in 4+1 years
   - Ph.D.: Doctor of Philosophy

3. Extended education
   - Post-Doc: in your own or extended field
What does Ph.D. mean?

There are different types of Ph.D.

- Doctor of Science = Ph.D. in science and engineering\(^a\)
- M.D. = Doctor of Medicine
- J.D./J.S.D = Juris Doctor/Doctor of Juridical Science

\(^a\)Columbia University, Bowie State University, The George Washington University (not any more after 2011), Harvard University, Johns Hopkins University, Massachusetts Institute of Technology, Robert Morris University, Towson University, Tulane University, University of Baltimore, Marymount University, and Capitol Technology University.

How is Ph.D. different from M.D. and J.D.?

- Ph.D.
- M.D./J.D.
What you do is who you are.

In "The Art of War",

Sun Tzu said

1. If you know the enemy and know yourself, you need not fear the result of a hundred battles.
2. If you know yourself but not the enemy, for every victory gained you will also suffer a defeat.
3. If you know neither the enemy nor yourself, you will succumb in every battle.

He did NOT guarantee any victory, but ask you to know yourself, at least not to fail, but to achieve your goals.
You need to know

About

1. what you enjoy and what you are good at: Hobby vs. Job
2. how your brain and heart works: Intelligence vs. Passion
3. what pleases and bothers you: Urgency vs. Significance

So, what do I do?

1. Take good care of your inner-self, i.e., yourself when you were young before you got hurt by others.
2. How? Reward yourself if you did a good job.
Know yourself better

use SWOT diagram

<table>
<thead>
<tr>
<th>STRENGTHS</th>
<th>WEAKNESSES</th>
</tr>
</thead>
<tbody>
<tr>
<td>- What is your unique selling proposition?</td>
<td></td>
</tr>
<tr>
<td>- What are your competitive advantages?</td>
<td></td>
</tr>
<tr>
<td>- What resources do you have?</td>
<td></td>
</tr>
<tr>
<td>- What do customers like about your product?</td>
<td></td>
</tr>
<tr>
<td>- What do you do better than your competitors?</td>
<td></td>
</tr>
<tr>
<td>- What advantages do your staff members have?</td>
<td></td>
</tr>
<tr>
<td>- What assets does your company have?</td>
<td></td>
</tr>
<tr>
<td>- Which areas of your business/projects could use improvement?</td>
<td></td>
</tr>
<tr>
<td>- What advantages does your company lack?</td>
<td></td>
</tr>
<tr>
<td>- What do your competitors do better than you?</td>
<td></td>
</tr>
<tr>
<td>- Which disadvantages do our workers/products have?</td>
<td></td>
</tr>
<tr>
<td>- Which internal factors interfere with your business success?</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OPPORTUNITIES</th>
<th>THREATS</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Does economic/political climate help you develop your business?</td>
<td></td>
</tr>
<tr>
<td>- Which external factors can give you an edge?</td>
<td></td>
</tr>
<tr>
<td>- How can market fluctuations aid you?</td>
<td></td>
</tr>
<tr>
<td>- Do these opportunities have temporary nature?</td>
<td></td>
</tr>
<tr>
<td>- Who are your competitors?</td>
<td></td>
</tr>
<tr>
<td>- Which market areas are potentially dangerous for your business?</td>
<td></td>
</tr>
<tr>
<td>- Which trends can negatively affect your business?</td>
<td></td>
</tr>
<tr>
<td>- Is there a product/innovation on the market that will make your product/innovation outdated?</td>
<td></td>
</tr>
</tbody>
</table>

Tasks

- Improve STRENGTHS to take best OPPORTUNITIES.
- Identify WEAKNESSES to avoid unnecessary THREATS.
Humans are aging, and so do the important thing first

Eisenhower matrix: Which box is the most important?

<table>
<thead>
<tr>
<th>URGENT</th>
<th>NOT URGENT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Priority 1</strong></td>
<td></td>
</tr>
<tr>
<td>Important calls/emails</td>
<td>Career growth</td>
</tr>
<tr>
<td>Appointments</td>
<td>Relationships</td>
</tr>
<tr>
<td>Emergencies</td>
<td>Preventative tasks</td>
</tr>
<tr>
<td>Projects with deadlines</td>
<td>Maintenance</td>
</tr>
<tr>
<td></td>
<td>Exercise</td>
</tr>
<tr>
<td><strong>Priority 3</strong></td>
<td></td>
</tr>
<tr>
<td>Some calls/emails</td>
<td>Social media</td>
</tr>
<tr>
<td>Some meetings</td>
<td>TV/Movies</td>
</tr>
<tr>
<td>Shallow relationships</td>
<td>Gossip</td>
</tr>
<tr>
<td>Some phone alerts</td>
<td>Trivial tasks</td>
</tr>
<tr>
<td><strong>Priority 4</strong></td>
<td></td>
</tr>
<tr>
<td>Some calls/emails</td>
<td></td>
</tr>
<tr>
<td>Some meetings</td>
<td></td>
</tr>
<tr>
<td>Shallow relationships</td>
<td></td>
</tr>
<tr>
<td>Some phone alerts</td>
<td></td>
</tr>
</tbody>
</table>
Make your own

- SWOT diagram: 2-3 items in each quarter
- Eisenhower matrix: 2-3 items in each box
Hmmm... What is this sport game?
Communication is everything

... because it determines your salary.

Why do we learn English?

- because the majority of high-quality technical information is written in *English* (US & UK).
- The more/better you read & write, the more you’ll be *rich* and *successful*.
- More importantly, and unfortunately, there is no other way around except "Publish or Perish".

W-R-e-S-T-L-e

1. Writing
2. Reading
3. emotion (of your own)
4. Speaking
5. Listening
6. Thinking
7. empathy (with others)
Wrestle cycle

### Communication processes: iterative

1. Inputs: Reading (⊃ Listening)
2. Processing: Thinking
3. Outputs: Writing (⊃ Speaking): then, go back to step 1.

### How to improve your listening and speaking

... in technical conversation like seminars

- dictate or jot down what you listen
- practice typing without looking at what you type
- write a full manuscript before you speak
- read 10 times per sentence.
The phrase “Publish or perish” initially coined by Coolidge\(^1\) in 1932 is now becoming a harsh reality.

Typing versus Writing

There are some active discussion and research about study efficiency using hand-writing versus typing. Some studies show:

1. The study revealed that students who wrote their notes on paper learned more than those who typed their notes

2. The research shows that students who took notes on their laptop did take more notes.

3. In addition, engineers and scientists should solve problems on paper for numerical calculations and mathematical derivations in systematic sequences.

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2 Note-Taking: Writing vs. Typing Notes
3 Don’t take notes with your laptop
4 The Science of Notetaking: Writing vs Typing
Typing versus Writing: suggestions

- Carefully prepare your best (a little costly) weapons!
  1. Writing devices (use for 24/7)
  2. Ergonomic Keyboards (buy two and carry one).
  3. Combined version (with digital pens): iPad, MS Surface, and so forth.
The Science of Notetaking – Writing vs Typing

Writing vs Typing

Those assigned to handwriting performed significantly better than those typed when tested on the material.

Exam Performance Distribution

Typing

Lower Performance

Higher Performance

Writing

Versus

Clearvue Health

Psychological Science
The Science of Notetaking – Writing vs Typing

Writing vs Typing

The study found that typed notes tended to be longer than handwritten notes.

Word Count

<table>
<thead>
<tr>
<th>Typing</th>
<th></th>
<th>Writing</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Mean:</strong> 310 Words</td>
<td><strong>Mean:</strong> 173 Words</td>
<td></td>
</tr>
<tr>
<td></td>
<td>SD: 70.7</td>
<td>SD: 116.5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>310 words</td>
<td>173 words</td>
<td></td>
</tr>
</tbody>
</table>
The Science of Notetaking – Writing vs Typing

**Writing vs Typing**

Students who typed notes were also significantly more likely to write things down word for word (p < 0.001)

**Word Overlap - % Copied Text**

<table>
<thead>
<tr>
<th>Typing</th>
<th>12.1% overlap</th>
</tr>
</thead>
<tbody>
<tr>
<td>Versus</td>
<td></td>
</tr>
<tr>
<td>Writing</td>
<td>6.9%</td>
</tr>
</tbody>
</table>

Clearvue Health

Psychological Science
The Science of Notetaking – Writing vs Typing

**Writing vs Typing**

**Conceptual Recall**

Students assigned to take notes by hand retained more concepts than students assigned to type notes (p=0.02)

**Learning: Concept Retention**

<table>
<thead>
<tr>
<th>Less Retention</th>
<th>More Retention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typing</td>
<td>-0.11 SD</td>
</tr>
<tr>
<td>Versus Writing</td>
<td>Average</td>
</tr>
<tr>
<td></td>
<td>+0.28 SD</td>
</tr>
</tbody>
</table>

(Images and data from Psychological Science and Clearvue Health)
"I think the take home message here isn't that somebody should never take notes on a laptop, but rather that the technology you use impacts the way you think and learn. It shouldn't be taken for granted that tech is always good, or always bad, but rather we should be thoughtful about the tech we adopt, and consciously consider the ways it might interact with our goals for the experience. Being deliberative in our use of technology will become increasingly important as cognitively enhancing technology becomes more prevalent."

Professor Danny Oppenheimer

- Use the technology to maximize your brain activities.
Academic Performance: Publications

Quality

- Quality of Journals: SCI is excellent, but SCIE is still good.
- If you are not sure, any journals (related to your research) in Elsevier is good enough.

Measurable Numbers

- MS plan B: one journal paper of literature review, submitted and accepted in the second year.
- MS plan A: one journal paper of original research, submitted and accepted in the second year.
- Ph.D.: No. of papers = No. of Ph.D. years finished - 1
  - E.g., if you are a third-year Ph.D., you are expected to have at least one published/accepted paper in SCI journal.
**Academic Performance: Presentations**

**Internal and local: Show up to the second latest results**

1. Show your results until the last semester.
2. Don’t include what you found yesterday.

**Formal conferences: Don’t present only to present.**

- Present only what has been published, or at least submitted to a journal (peer-reviewed). If not,
  1. your novel work will be stolen the next day.
  2. you won’t get a job easily, because your future-boss wants to read (not only listen) what you have done.
  3. your future-boss wants to steal your results and techniques by hiring you after reading your work (not an interview).
  4. he/she also wants to make sure that you (can) will reduce his writing burdens. → Have first-authored paper(s).
Publications: Less critical ones

- **Book related**
  1. Entire books: very rare. Some of them are textbooks
  2. Edited Books: You almost don’t write, but collect and organize other authors’ chapters.

- **Conference-related**
  1. Proceedings
  2. Conference papers

- **Technical notes: posted in pre-print sites**
  1. e.g., arxiv, bioArxiv, mediArchive, and so forth
  2. You can post brand new preliminary results, new mathematical derivations, and so forth.

- **Media appearance for technical opinions**
  1. News papers and TV
  2. Social Media: not tweets, but like tutorial videos on YouTube.

5http://higheredprofessor.com/2016/12/05/types-academic-publications/
Publications: Critical ones

Journals Articles for early career researchers

1. **Original research**: the primary
2. **Review article**: important but not as frequent as original research papers
3. **Clinical case study**: not directly related to engineers
4. **Clinical trial**: not directly related to engineers
5. **Perspective, opinion, and commentary**: mostly for well-known researchers, not for Ph.D. students
6. **Book review**: rare, less important.

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6 Article types that journals publish: A guide for early career researchers
1. We know that you are smart, but if you don’t ask questions, we cannot help you.
2. Don’t hide and don’t be silent.
3. Show your stupidity that you believe. We will take it as creativity.
4. Regularly/frequently meet your advisor and inform your committee members about your research progress.
5. The more you communicate with your committee members, the easier/smother your defense will be.
6. You should have extra 3 months of backup time before defense.
7. Students often spend one more semester than they planned.
8. Don’t be ambitious to finish your degree tomorrow. There is no magic.
9. Polishing your thesis will take more time than writing the first draft. Revisions can take more time.
10. Use advanced feature of word processors for numbering, indexing, and bibliography.
11. Don’t make your committee members signature-producing machines.
12. They are your life long human resources, who are your supporters, mentors, and coaches.
13. Start early and show your mistakes. Then, your future will be bright.
14. Students’ virtues are: sincerity, diligence, and creativity.
15. Creativity is connecting disconnected dots in different zones. The 21st academia calls it "Convergence" or "Consilience", which we had called "inter-disciplinary", "trans-disciplinary", or "multi-disciplinary".
Graduate study page under CEE website

Civil-Engineering-Graduate-Handbook
• East-West Center several programs\(^7\)
• EE Black – handled off-line by CEE – Grad Chair
• Others\(^8\):
  1. David C. and May T. Liu Civil Engineering Fellowship – (for Geotech grad students)
  2. L. Stephen Lau Water Research Scholarship Fund (for Water grad students)
  3. Professor Yu-Si Fok and Family Civil and Environmental Engineering Scholarship
  4. Hawaii Pacific Steel Framing Alliance Scholarship (for Structures grad students)
  5. Structural Engineers Association of Hawaii Graduate Scholarship Fund (for Structures grad students)
  6. Lorenzo C. Fruto Memorial Scholarship Fund (MS only)

\(^7\)https://www.eastwestcenter.org/education/education
\(^8\)https://www.eng.hawaii.edu/scholarships/
Everette Earl (E. E.) Black Scholarship

**Description**

This fund memorializes E.E. Black, chairman and president of The Gas Company, now Hawaii Independent Energy

**Criteria**

1. Full-time classified CEE graduate student.
2. Minimum 3.5 GPA.
3. Evidence of financial need.
4. Primary consideration given to sons/daughters of engineering, building contractors, and construction workers in the Hawaii construction industry whose first degree in engineering was obtained at UHM.
E. E. Black

Who he was

1. Born March 21, 1889, Vigo County, Indiana
2. Came to Hawaii in June, 1913, for engineering work on the great Walahole water tunnel project on Oahu...

The Late E. E. Black
Know yourself more to take care of your inner-self better.

2. Open your mind, try your best, and show them to us (faculty members, not monsters).

3. Be successful by doing things urgent, important, and bothering you the most.

   W→R→e→S→T→L→e→W→R→e→S→T→L→e→W
   W→R→e→S→T→L→e→W→R→e→S→T→L→e→W
   W→R→e→S→T→L→e→W→R→e→S→T→L→e→W
   … Success will come quietly.

4. Survive to Succeed and Succeed to Serve.
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http://albertsk.org
http://hicovid.net
Questions and comments?