

Graduate School

KEYS TO

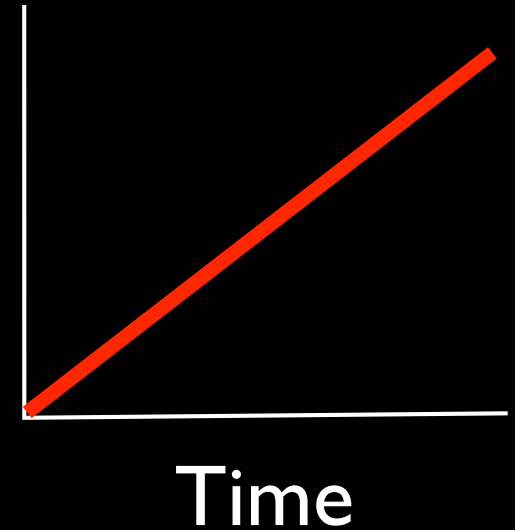
SUCCESS

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The Big Transition

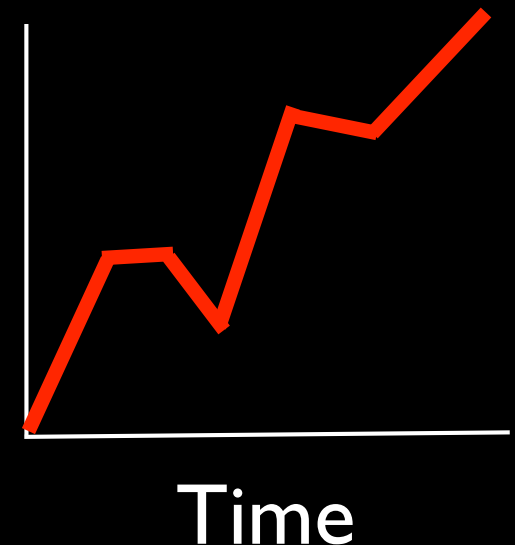
Undergraduate life

- Read books, do assignments, get good grades
- **Consumer** oriented:
soak in existing knowledge

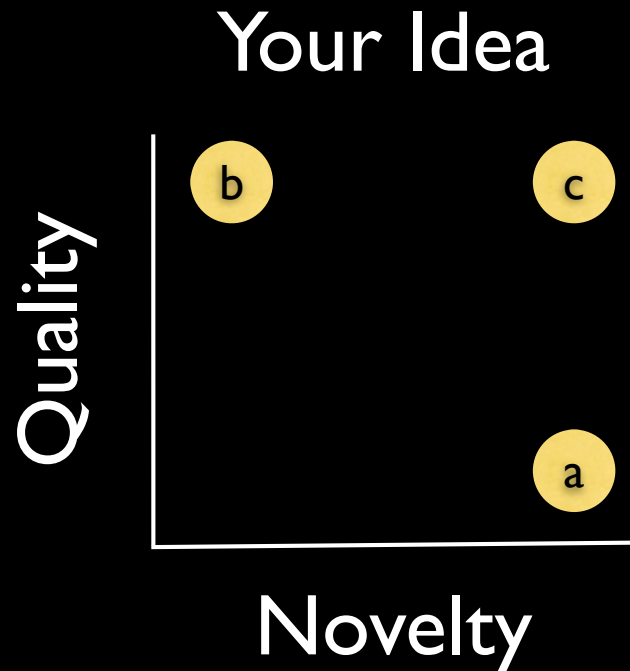


Graduate life

- Read (and criticize!) papers, do research projects, who cares about grades?
- Transition to **Producer**:
creator of new knowledge



Research Is Hard



It's hard to make something that's interesting... Basically, anything that anyone makes... It's like a law of nature, a law of aerodynamics, that anything that's written or anything that's created wants to be mediocre. It's all tending toward mediocrity the way that all the atoms are dissipating out toward the expanse of the universe. Everything wants to be mediocre, so what it takes to make anything that is more than mediocre is an **extreme act of will**. You just have to exert so much will into something for it to be good.

- Ira Glass (This American Life)

Keys To Success

Understand Classes

Fundamental shift from undergrad to grad classes

Goals

- Learn things that might help your research
- Learn about things that might interest you
- OK not to get top grade in class anymore

Focus on

- **Read:** How to read research papers
(read a lot, but not too much)
- **Analyze:** how to critique research work
- **Work:** a taste of research in given area

Understand Advising

Advisor-student relationship key to grad school

A good advisor...

- Gives regular advice on your research
- Helps you find and refine problems
- Helps you learn how to communicate (both written and orally)
- Gives you lots and lots of critique

How to find right advisor?

- Take classes, do independent studies: try before you buy!

Understand Your Role

Your role: **Be in charge** of your own education!

What a good student does

- **Be organized** (notes, thoughts, meetings)
- **Make progress** every day
(not day before meeting)
- **Work hard** (50% RA != 20 hrs/week)
- **Develop good habits**
- **Take ownership**

Recognize: Professors are (usually very) busy

- Demand their time through your dedication

Know Your Peers

Sometimes, can learn more from peers than profs

Thus you should:

- **Be social** (well, somewhat)
- **Be reliable** as a project partner, officemate
- **Be active** in reading groups, talks, etc.
- **Be around** the building

“80% of success is just being there” -Woody Allen

Be A Continuous Learner

Always look to learn new things

- Conceptual (a new research paper)
- Practical (a new scripting language)

Read **broadly** (not just in your area)

- Sometimes ideas from other domains are key to progress in yours

“If you’re smart, what you do is make connections. To make connections, you have to have inputs. Thus, try to avoid having the same exact inputs as everyone else. Gain new experiences and thus bring together things no one has brought together before.” -Steve Jobs

Don't Just Learn, Teach

When you feel comfortable explaining it,
you probably really understand it (finally)

- Secret joy of being a professor!

So teach those around you

- Your advisor
- Your peers
- Your mirror

Have Thick Skin

Typical conference

- 200 submissions
- 25 acceptances
- **Rejection** is the common case

Research demands **thick skin**

- Learn from mistakes
- Avoid perfectionist thinking
- Critique is there to make you better!

“Ever try? Ever fail? No matter. Try again. Fail again. Fail better.” -Samuel Beckett

Develop Taste

Focus on developing **taste** in problems

- What you work on is key to success
- What is important?
- What can you do well? (better than others?)

“Maturation as a scientist involves many components, but a **key one for me was the development of taste**, much as it is in the enjoyment of art, music, food, or wine. One needs to learn what problems are important. I sensed myself developing taste, distinguishing what was interesting from what was not - and among the things that were interesting, **I also learned what was doable.**” -Eric Kandel

Communicate Often

Written

- Well-written papers more likely to be accepted
- Writing down thoughts helps clarify true nature

Oral

- Give as many talks as possible
- Professors (and TAs!) get lots of practice

Get **feedback** on both (from advisors, peers)

Hamming: Researcher should spend 50% of time communicating what they do to others

Be A Self Starter

New York Giants football motto:

- Don't complain
- Expect nothing
- Do something

In general, great research isn't given to you

- Rather, you make it happen!
(don't sit back and take classes and wait)

What my advisor told me on my first day:

Sink or swim!

The Two Kinds of Gifts

From “The Art of Game Design” [Schell '08]

There are two kinds of gifts. First, there is the innate gift of a given skill. **This is a minor gift.** If you have this gift, a skill such as doing math or playing the piano comes naturally to you. There are millions of people with minor gifts of all kinds who never do anything great with their gifted skills, because they lack the major gift.

The **major gift is the love of the work.** This might seem backward. How can love of using a skill be more important than the skill itself? It is for this simple reason: if you have a major gift, you will do things with the skills you have. And keep doing them. And your love of the work will shine through. And through practice, your skills will grow and become more powerful, until your skills are as great or greater than someone who only has the minor gift.

There is only one way to find out if you have the major gift. **Start down the path, and see if it makes your heart sing.**

Questions?