7 Easy Ways to Fail a Ph.D.*

1. Focus on grades or coursework

No one cares about grades in grad school.

There's a simple formula for the optimal GPA in grad school:

$$\text{Optimal GPA} = \text{Minimum Required GPA} + \varepsilon$$

Anything higher implies time that could have been spent on research was wasted on classes. Advisors might even raise an eyebrow at a 4.0

During the first two years, students need to find an advisor, pick a research area, read a lot of papers and try small, exploratory research projects. Spending too much time on coursework distracts from these objectives.

2. Learn too much

Some students go to Ph.D. school because they want to learn.

Let there be no mistake: Ph.D. school involves a lot of learning.

But, it requires focused learning directed toward an eventual thesis.

Taking (or sitting in on) non-required classes outside one's focus is almost always a waste of time, and it's always unnecessary.

By the end of the third year, a typical Ph.D. student needs to have read about 50 to 150 papers to defend the novelty of a proposed thesis.

Of course, some students go too far with the related work search, reading so much about their intended area of research that they never start that research.

Advisors will lose patience with "eternal" students that aren't focused on the goal: making a small but significant contribution to human knowledge.

In the interest of personal disclosure, I suffered from the "want to learn everything" bug when I got to Ph.D. school.

I took classes all over campus for my first two years: Arabic, linguistics, economics, physics, math and even philosophy. In computer science, I took lots of classes in areas that had nothing to do with my research.

The price of all this "enlightenment" was an extra year on my Ph.D.

I only got away with this detour because while I was doing all that, I was a TA, which meant I wasn't wasting my advisor's grant funding.

3. Expect perfection

Perfectionism is a tragic affliction in academia, since it tends to hit the brightest the hardest.

Perfection cannot be attained. It is approached in the limit.

Students that polish a research paper well past the point of diminishing returns, expecting to hit perfection, will never stop polishing.

Students that can't begin to write until they have the perfect structure of the paper mapped out will never get started.

For students with problems starting on a paper or dissertation, my advice is that writing a paper should be an iterative process: start with an outline and some rough notes; take a pass over the paper and improve it a little; rinse; repeat. When the paper changes little with each pass, it's at diminishing returns. One or two more passes over the paper are all it needs at that point.

"Good enough" is better than "perfect."

4. Procrastinate *(Meaning: Postpone doing something as a regular practice)*

Chronic perfectionists also tend to be procrastinators.

So do eternal students with a drive to learn instead of research.

Ph.D. school seems to be a magnet for every kind of procrastinator.

Unfortunately, it is also a sieve that weeds out the unproductive.

5. Go rogue too soon/too late

The advisor-advisee dynamic needs to shift over the course of a degree.

Early on, the advisor should be hands on, doling out specific topics and helping to craft early papers.

Toward the end, the student should know more than the advisor about her topic. Once the inversion happens, she needs to "go rogue" and start choosing the topics to investigate and initiating the paper write-ups. She needs to do so even if her advisor is insisting she do something else.

The trick is getting the timing right.

Going rogue before the student knows how to choose good topics and write well will end in wasted paper submissions and a grumpy advisor.

On the other hand, continuing to act only when ordered to act past a certain point will strain an advisor that expects to start seeing a "return" on an investment of time and hard-won grant money.

Advisors expect near-terminal Ph.D. students to be proto-professors with intimate knowledge of the challenges in their field. **They should be capable of selecting and attacking research problems of appropriate size and scope.**

6. Aim too low

Some students look at the weakest student to get a Ph.D. in their department and aim for that.

This attitude guarantees that no professorship will be waiting for them.

And, it all but promises failure.

The weakest Ph.D. to escape was probably repeatedly unlucky with research topics, and had to settle for a contingency plan.

Aiming low leaves no room for uncertainty.

And, research is always uncertain.

7. Aim too high

A Ph.D. seems like a major undertaking from the perspective of the student.

It is.

But, it is not the final undertaking. **It's the *start* of a scientific career.**

A Ph.D. does not have to cure cancer or enable cold fusion.

At best a handful of chemists remember what Einstein's Ph.D. was in.

Einstein's Ph.D. dissertation was a principled calculation meant to estimate Avogadro's number. He got it wrong. By a factor of 3.

He still got a Ph.D.

A Ph.D. is a small but significant contribution to human knowledge.

Impact is something students should aim for over a lifetime of research.

Making a big impact with a Ph.D. is about as likely as hitting a bullseye the very first time you've fired a gun.

Once you know how to shoot, you can keep shooting until you hit it.

Plus, with a Ph.D., you get a lifetime supply of ammo.

Some advisors can give you a list of potential research topics. If they can, pick the topic that's easiest to do but which still retains your interest.

It does not matter at all what you get your Ph.D. in.

All that matters is that you get one.

It's the training that counts--not the topic.

** Matthew Might, Source: http://matt.might.net/articles/ways-to-fail-a-phd/*