

## **Making Lemonade – Dealing with the Unknown, Unexpected, and Unwanted During Graduate Study**

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### ***Abstract***

Graduate study can be a risky endeavor. Typically, graduate students perform research work that has not been done before, so problems are not uncommon. In addition to the technical challenges of doctoral work, there are other potential problems, be they cultural, interpersonal, budgetary, or other.

When a problem arises, there are productive and unproductive ways of reacting. Based on the author's experience and observation, this paper seeks to identify some common difficulties graduate students may encounter, and propose some possible actions to deal with them. As the old saying goes, when you're handed a bunch of lemons, sometimes the best thing to do is to make lemonade.

### ***Introduction***

In many ways, completing a graduate degree has many similarities to an old-time crossing of the North Atlantic Ocean. In both cases, the desired endpoint is known but the conditions along the way are not. Successful transit boils down to the art of applying "course corrections" in a smart and timely manner. For academic pursuits the key is to look ahead, see an obstacle coming, and devise a way around it.

### ***Cultural issues***

By cultural here I mean endemic to academia. Doctoral study, and sometimes Master's thesis work, is an open-ended endeavor which requires a certain amount of flexibility on the student's part. Areas of contention include establishing degree requirements, dealing with changing requirements, and defining the completion of your efforts.

### **Documentation**

Although degree requirements are commonly listed and available for BS & MS degrees, most schools do not document policies in detail regarding PhD degree requirements since these requirements encompass so much more than objective measures. On the positive side, this allows the school flexibility in dealing with individual circumstances. On the negative side, this can be used to impede progress as well if unanticipated tasks are repeatedly added to your degree requirements.

Rules vary from institution to institution, school to school within an institution, and department to department within a school. Try to find out as much as you can not only of what is written down but also what is known by, and available from, the elder grad students.

#### The only constant is change

Considering that doctoral degrees require anywhere from three to eight years to obtain, it is highly likely that graduation rules will change in some manner during your time in grad school. Some schools grandfather you to the rules in force when you initially enrolled, some give you the choice of using any rule set in force while you were there, and others just revert to the new rules. You should find out what your school's policy is.

#### Graduate study is not a life sentence

Academia is somewhat unique in that just about the time the faculty decide that you're getting good at something, they send you away with a degree. Although it may be tempting to keep a productive grad student in their lab, faculty members for the most part recognize that timely turnover is needed in the graduate population. You should be able to get a rough idea of the time needed to obtain a degree at your school by talking to the elder grad students and tracking how long the currently finishing students have been around. These numbers will likely vary by school, by department, and by research group.

#### There's a light at the end of the tunnel, but it might be a train...

Ever notice that folks reach a point where they say they are about six months away from defending, and they stay that way for over a year? Recognize that as you get close to finishing, you'll find several little things that you really need to know to complete the "story" of your dissertation – these things will take time to figure out, and this is the source of most people's delay in finishing.

#### There's just this other little bit of the puzzle we'd like you to look at...

Your committee can decide that what you've done isn't enough to justify a degree yet, and they are fully within their rights to indicate areas they feel should be investigated more fully. If you feel this judgement is unfair, you can go up the chain of command – talk to your department head or dean.

#### Who makes these rules, anyway?

Most decisions affecting you will be made by your Dean (Graduate or Engineering, depending on your institution's setup) or either your Department Chair or Director of Graduate Studies. If you wish to propose a policy change, talk to one or more of them.

#### *Interpersonal issues*

Given that you will be surrounded by mostly tenured faculty, remember that you are the temporary presence on campus. You were drawn to your school by an interest in research and/or

personnel there, so now it's your job to figure out how to do what you want and make it work. Issues include selecting and dealing with the people who will most affect your experience in graduate school.

### Choosing your research advisor

Often, students choose to attend a given graduate school because of the work being done there and the folks doing it. If this is the case, you already have a pretty good idea of whom to ask about research work. Many times, students have a general idea of what they want to do but not a specific one. In this case, you'll need to find out the specifics of each faculty member's interests and figure out where your interests and theirs overlap well.

Ideally, you should talk to other members of any potential advisor's research group before deciding to join. If the faculty member has no other grad students, talk to the elder grad students in the department and find out why. As the only grad student working for a faculty member you won't have to fight for time to meet with her/him, but project funding may be a liability (see info following).

Not only research interests but also interpersonal styles will affect the success of your working relationship with your research advisor. If you are a global learner who mulls over problems and then produces a flurry of activity to come up with a solution, this may not mesh well if you work for someone who expects regular, sequential updates showing progress. Likewise, if your advisor has a laissez faire management approach, you could feel as though you've been cast adrift without a compass. You may have to adjust your work preferences to accommodate your advisor's style, or discuss a compromise, if there is a big difference in how you approach things. As long as the work is getting done, most advisors won't mind the manner in which it is being accomplished.

If all goes well, you'll find an advisor with a compatible management style doing research in an area of interest to you with adequate funding to offer you a position in the lab.

### Identifying mentors

Remember that potential mentors aren't just faculty members – they can be staff, fellow graduate students, or others. The key is that a mentor offers you a different view of things that, due to his/her perspective or experience, you would not normally see. You may have several mentors, each with a different set of interests or abilities that are helpful to you.

The elder graduate students can be very helpful mentors since they may have either experienced or witnessed many of the issues with which you are dealing. Recognize that they may get very focused on completing their degree as they get close to finishing, and they may have limited time and/or energy to spend with you. Try to establish relationships with students at different stages of their studies – the experiences of newer graduate students will be closer to yours, but older graduate students may be able to establish more long-term trends and give historical perspectives

on the workings of the school. Also be mindful that you will likely mentor others as you advance in your studies; remember to pass along what you have learned.

Faculty members often have a very different perspective on the academic system than fellow graduate students. Faculty can provide insight into all phases of graduate study, and can be a great resource for students seeking employment after attaining their terminal degree. They can have incredible demands on their time between teaching, research, and service activities. Even so, most find time to answer the myriad of questions posed to them by students related to widely varying subjects. Try to respect the precious nature of a professor's time, and be succinct when you are seeking information.

#### Faculty sabbaticals/retirement/death

Sabbaticals are usually planned well in advance (at least a year), so adequate notice should be possible – check with elder graduate students to find out who has recently gone on sabbatical, and who may be due for one. You may have to plan your research around your advisor's sabbatical, communicate remotely during that time, or maybe even accompany your advisor if s/he is going elsewhere to do research. Any of these may have the consequence of added time to complete your degree.

Retirements are a bit more dire, since for the most part you need to finish your degree before your advisor retires. In some cases, retirees who remain nearby will continue to work with their graduate students after retirement and there is a lesser sense of urgency to complete the degree requirements. Again, faculty usually plan retirement in advance and try to arrange things so that their students will be complete in time. You may be rushed to finish, but it should happen.

In case of your advisor's unexpected death, you will need to find another faculty member to oversee the completion of your research project. Depending upon the source of project funding, money may be transferable to another investigator so you may be able to continue working as you had, just for another principal investigator. If you were early in your project and funding is not mobile, you may be forced to transfer to another research project.

#### Conversing calmly at 80dB...

Especially as you near the end of your research project and become more of an authority on the subject you are researching, disagreeing with your research advisor is normal. Shouting about it is not. A working relationship will generally be productive, whether you agree or disagree, as long as both parties respect each other.

Even if you get really frustrated, work hard to control what you say – what is said cannot be unsaid, and if you intend to pursue a career in your field of research you will likely run into your advisor again. And again. And again. Don't make an enemy if you can help it.

### This research project just isn't working out...

If you find yourself in a situation without remedy, your best course of action may be to change either advisors or projects. The consequences of changing either one of these are not insignificant, and may be characterized by an increase in time to obtain your degree as well as some political fallout. If you make this decision early in your program, the added time will be minimized.

Your first option is continuing your research but with a different advisor. If you are at an institution with enough faculty that another person is knowledgeable enough to guide your work, this may be feasible. By continuing to work in the same area you started in, you will not lose much time.

If you decide to change research projects, you will lose some time. All of your coursework should still apply, as well as any qualifying exams taken. If your candidacy exam was based on your research project, you will have to redo that. If you are lucky, you can apply much of what you learned in your initial research to your new project. Regardless, your mental outlook should be better as you begin work in the new research arena.

Whatever happens, try to separate from your original advisor on amicable terms. Academia is a small community, and you don't want to burn any bridges if you can at all avoid it.

### *Monetary issues*

Don't expect to live well as a graduate student, but you shouldn't have to worry about starving, either. Pick the brains of other grad students to find reasonable living quarters and vendors for food, etc. so that you can live comfortably on the money you have during your time in grad school. Monetary concerns include research funding as well as personal funding.

### Size matters

Small research groups are more prone to funding difficulties than large research groups, due simply to the fact that they are typically supported by a smaller set of grants – if one is lost, it is a larger percentage of the group budget. This doesn't mean that smaller groups lose funding at a higher rate than large groups, it's just that when it does happen it generally has a greater effect. Just realize that research funding is not a given, and that you may have to change funding types during your study (research assistant, teaching assistant, etc.).

### What do you mean, the grant is gone?

Research is typically funded through outside grants. Sometimes these monies disappear either due to expiration of the grant without renewal, failure of the grant agency to pay its obligations to the school (i.e., default – more of a danger with grants from small, private foundations or companies), or a mid-project reallocation of funds by the grant agency. Before you commit to work on a research project, get a good idea of the budget source for the project and the timeline for its completion.

If you are caught on a project that loses funding, hopefully this will not have come as a total surprise and you will have had a bit of time to prepare and find other options. The project leader should develop an exit strategy or a transition plan to other funding.

If you feel abandoned by your advisor, work your way up the chain of command through your department head and dean. You may find at least personal funding of which your advisor is unaware. If research funding remains scarce, talk to your advisor about reducing the scope of your project so that remaining or discretionary funds may be adequate. If this is not possible, you have two choices: self-fund, or change projects to one with available funding. When pondering your options, remember that each year you stay in grad school has an opportunity cost equal not only to your cost of attendance but also the salary and career advancement you would have earned in the “outside” world.

Money can't buy happiness, but it sure can make misery much more livable...

Simplify your outside concerns while you're in school, as possible – make sure that you're not worrying about paying the bills at the end of the month. If this means taking out more loans, do it. You'll make enough money when you get out to pay them off, and it will ease your mind tremendously during the most stressful points of your study if you don't have to worry about money. Check out your options with your school's financial aid office.

#### *Other concerns*

Just because I'm paranoid doesn't mean they're not out to get me!

Contrary to how it may seem at times, your School's policy was not written specifically to make your life difficult. If you can't figure out how to maneuver through the obstacles, graduate studies can be extremely challenging.

If you are consistently having problems, realize that you might be actually compounding them. If you continually complain about your situation to the administration, you could be labeled as a habitual whiner and people may start discounting your requests no matter how valid. Go talk to someone else, and pick carefully which battles are worth fighting.

#### *Other perspectives*

This paper is by no means a comprehensive treatment of all issues which may arise during graduate school. There are many published sources of information providing other perspectives and advice for success in graduate study, a sampling of which are listed here:

B. Lazarus, L. Ritter, S. Ambrose. The Woman's Guide to Navigating the Ph.D. in Engineering & Science. IEEE, 2000. ISBN 0780360370.

National Academy of Science. Adviser, Teacher, Role Model, Friend: On Being a Mentor to Students in Science and Engineering. National Academy Press, 1997. ISBN 0309063639.

- R. Peters. Getting What You Came For: The Smart Student's Guide to Earning an M.A. or a Ph.D. Nooday Press, 1997. ISBN 0374524777.
- D. Bloom, J. Karp, N. Cohen. The Ph.D. Process: A Student's Guide to Graduate School in the Sciences. Oxford Press, 1998. ISBN 0195119002.
- L. Mitchell. The Ultimate Grad School Survival Guide. Petersons Guides, 1996. ISBN 1560795808.
- P. Feibelman. A Ph.D. Is Not Enough: A Guide to Survival in Science. Perseus Publishing, 1994. ISBN 0201626632.
- A. Paredes. Play The Game: How To Get Accepted and Succeed in Graduate School. Xlibris Corporation, 2000. ISBN 073881461X.

## ***Conclusions***

To deal with any obstacles to obtaining your degree, your best bet is to learn as much as you can about your surroundings and form a support network. Fellow grad students in your department, in other departments, and at other institutions can provide perspective and educate you on common policies and practices. Staff and faculty members can provide guidance and suggestions, and also serve as an “early warning system” at times. Having access to all these assets will aid you in dealing with not only any of the aforementioned difficulties, but also other obstacles you may encounter. To return to the nautical allusion, avoid the icebergs and turn into the approaching swell for the best ride.

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