# Pep Talk on Research

By David N. Weil
Brown University

Once you finish the Core exams, you have only one job: produce research. Research is what gets you a Ph.D. and a job. The only function of upper year courses is to get you going on research. The only bottom line is research.

1. Writing a thesis is not like anything that you have done before. Previously, all you had to do was absorb material that was presented to you. Now you have to do original work yourself.

2. Students often expect that they will do a thesis as follows: they will come across a problem that has to be solved (or one will be given to them), and they will solve it. This is indeed how many theses are done in the sciences. However, it very rarely happens in our field. Papers often read as *if* they had been written that way. But usually the process by which the paper was written (and the problem defined) was much more indirect.

3. Some students use the approach of trying to master everything relevant to a topic before they begin writing a thesis. This is a mistake. You will never feel that you have learned everything. The best thing to do is start doing research, and then master whatever tools and auxiliary material you need as you go along. It is much better to present your work and look foolish because you didn't know something that you should have than to not have anything to present.

4. Similarly, many students think that the way to write a thesis is to spend a long time developing a topic, and then, once the topic is well defined and approved by advisors, begin writing. This does not work. You can only really define your topic as you go along.

5. Doing research is a skill. The only way to learn it is to do it. The sooner you start the better. Your first few productions will be bad and this happens to everybody. So don't be a perfectionist. Get practice going through the process.

6. Second and third year field courses are not like any other course you have taken before. The goal is not to master some material and take a test at the end. You are not being judged (as you are during the first year). The only goal is to give you tools and to get you moving on research.

7. See your advisors a lot. A huge amount of time is wasted by students going off on tangents, re-inventing the wheel, or trying to solve impossible problems. Use your advisors as a guide to where you should be going.

8. Talk to your peers. You have to learn how to talk about your work. Also, listening to others talk about their work will help you develop a better feel for how research is done.

9. Don't be scared to write things down and show them to friends and advisors. Early criticism is essential in guiding you on the right path. Accepting criticism is a skill to be learned. Criticism hurts infinitely more when it is applied to a finished project that you have invested a lot of effort in. Remember, we do not expect the same quality output from grad students that we do from faculty, and we do not expect the same quality from early projects that we do from a dissertation. But if you don't produce any output, you will never get better.

10. If you are ambivalent as to what subject to work on or what advisor to work under, pick one and work quickly. If you take two months writing a paper on a subject that you subsequently decide does not interest you, then you have gained valuable experience doing research that can be applied elsewhere. If you spend a year writing the same paper, you will be trapped with a subject that you don't like.

11. Read journal articles and working papers, and go to seminars (both regular weekly workshops and job market seminars) and weekly lunches. This is the only way to learn what good research is like. But read papers intelligently: you don't have to go through most papers equation by equation. As your interests narrow down, there will be some papers that you do want to go through with a fine tooth comb. Your comfort with reading journal articles will grow with the number you read.

12. Keep your eye on the bottom line. Is the way in which you are spending your time bringing you closer to producing research output?