



Letters to the Editor

What problems have you faced in your research and how have you overcome them?

Learning about the Field

Thinking back on my first research project, I recall being overwhelmed with the amount of material I needed to learn at the outset. Since I didn't know anything about the field I was researching, I tried to learn everything about it before I started tackling the problem. That was a big mistake – subsequent research experiences revealed that complete knowledge is too lofty a goal and that I could spend an entire lifetime trying to attain it without making any progress on the research problem at hand. By observing my professors, however, I came to realize that successful researchers have coping mechanisms to deal with incomplete knowledge. Here are some that have served me well:

1. *prioritize – what do you need to know the most in order to make progress?*
2. *read everything made available to you and seek out more, but don't use reading as an excuse not to make progress*
3. *multitask – when stuck on a difficult problem or issue, is there something else that you can pursue that would help you make progress?*
4. *simultaneously attack the problem from different angles*
5. *pester people who might have the info you need (but be sure to respect their time)*
6. *initial solutions are rarely perfect – propose working models so that you can continue to make progress*

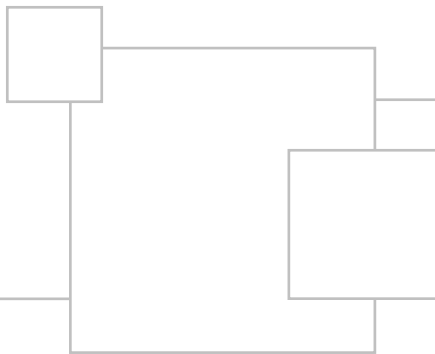
Now-a-days, I continue to encounter obstacles in my research. Despite these obstacles, I do my best to find a way to make progress, and that, in my opinion, is key to being a successful researcher. Sincerely,

—Gautam Altekar '04
Computer Science Major

Research is Learning How to Think Critically

Looking back at the past four years and talking with my friends at other universities, I have found conducting research at the University of Rochester to be very “undergraduate friendly.” The biology department offers many chances to gain research experience through the independent research course (BIO 395), the GEBS summer scholars program, and the de Kiewiet summer research fellowships. Once in a research lab, I found obtaining results challenging and time consuming. In my junior year I began doing research as part of the BIO 395 course and worked through my senior year with the intention of doing a senior thesis. However, at the end of my senior year, I was unable to gather enough positive results to compose a coherent thesis. The biology faculty that I spoke with were extremely understanding when I explained my situation. Although it can be quite intimidating to begin working in a lab (as it was for me), it is crucial to realize that faculty do not expect ground-breaking results at the undergraduate level. Rather, it is beginning to learn critical thinking skills and acquiring some hands-on experience that is important in doing research as an undergraduate, and the UR faculty provide ample opportunities to become involved.

—Maximilian Wei-Lin Popp '04
Molecular Genetics (B.S.) and Chemistry (B.A.) Majors



Finding a Research Topic

Many students look forward to conducting original research in order to better prepare themselves for graduate work, to improve their academic resume, or to delve further into a topic in which they have great interest. Unfortunately, like money, interesting testable hypotheses do not grow on trees, and without a topic, your aspirations of breaking new ground in academia are stopped dead in their tracks.

So in order to prepare yourself to conduct research, you should gain a deep understanding of one area in a discipline that interests you. By becoming familiar with theories and contemporary research, you provide yourself with a solid framework through which to evaluate your topic. For example, my thesis is focused on representation by African Americans, so I took classes on voting rights, congressional elections, and theories of representation. This grounding is also important because new research is conducted to build on the current understanding of a topic or to inquire into related areas that have not yet been explored.

Once you have a good background, it is time to design a research question that your project will set out to answer. This question should be both interesting and doable. The crafting of your topic is without a doubt the most important step in the process because if you select a question that does not interest you, research will quickly turn from something that is supposed to be an enlightening intellectual experience into an unbearable chore. In addition, because each of us is operating with limited time and financial resources it is critical that your

research topic be sufficiently limited in scope. You cannot expect to be able to dedicate forty hours a week to your research, have time for your other classes, and still have some time to enjoy yourself. In that same vein, it may not be fiscally viable to choose a topic that requires you, for example, to travel the world collecting DNA samples of indigenous inhabitants of the world's rainforest. While your department may be able to offer limited financial resources, you should strive to keep costs to a minimum. In addition to these more obvious pitfalls, you may also run into the problem of necessary data not being available or the required analytical methods being too complex. Sometimes these problems prove to be surmountable; sometimes they do not. In either case, they are something that needs to be considered.

Faculty in your department will be invaluable in helping you develop your topic: make appointments with professors who perform their own research in an area that interests you. They may have ideas for projects that they have not had the time to study yet, and even if they don't, they will definitely be able to help you think about hypotheses that would be ideal for your research.

Despite the hurdles, I am glad I decided to write a senior thesis. It has allowed me to apply what I have learned at the U of R in ways that regular classes would not have. Anyone can make independent research a rewarding undertaking, if they take the time to fully explore their options and select a doable topic that particularly interests them.

— Mark Dundon '04
Political Science and Economics Major