Academic Supervision Dossier

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1. Supervisory Philosophy. My goal as an academic supervisor is fostering that mixture of confidence, directed curiosity, and critical thinking that results in successful scientific research. Several themes grow from this goal. The first is embarking on discovery with each person that I supervise. The scientific enterprise requires a skeleton of logic, with a thick skin of rigor in execution to produce verifiable results, but the heart of it is discovery. Why else would we undertake the inevitable tedium of cross-checking, verifying, and re-writing that occupies most of our time in science? I view supervision of academic research, leading to theses and published reports, as a shared journey from what we know to new knowledge, often in an applied context.

   The second theme, again a matter of fostering confidence and habits of mind that lead to success in science or whatever professional road taken, is nudging each person toward ever increasing responsibility. This includes taking responsibility for the institutional requirements that attend being a student, such as organizing committee meetings.

   A third theme, one that students will not always be aware of, is risk management by the supervisor. By this I mean steering the journey of discovery away from dead ends, away from questions where negative results register as failure, and toward questions where the result is interesting, regardless of how the observations come out. Risk management includes helping students navigate formal and informal institutional arrangements, and navigate the shoals of peer review.

2a. Fostering Student and Research Staff Success in Research and Scholarship – Style.
   My participation in this journey of discovery depends on the person and their motivations, ranging from summer students, to honours students, M.Sc. students, Ph.D. students, post-docs, and the young professionals that I hire as research assistants or research associates (RAs). In my experience academic supervision spans this entire range, it extends to any thesis student, and it extends to research staff. For summer students, supervision that fosters professional development means that I explain the prior science, why the questions we are asking matter, and why

protocols are needed. The student thus understands and participates in the science behind their chief activity, which is assembling observations that successfully address some question. For honours students, fostering professional development means that I take the additional step of explaining how science is communicated in a thesis. For Masters students in biology, the context is often already defined but it is up to the student to develop the protocols, assemble observations, and communicate results in first of all a thesis, then in a publication. Ph.D. students are expected to develop the context, the question, the protocols, and communicate a series of results in the form of a thesis and series of publications. For post-docs, the journey of discovery begins at the intersection of two sets of knowledge, mine and that of the post-doc. For the young professionals that I hire as RAs, the shared journey usually begins with the proposal that funds them. Fostering professional development means engaging each person supervised in the concepts and modes of thought that drive the practice of science.

My habits in supervising students and research staff are several. First, I take an active interest, at the outset, in student goals and motivation. How did you get interested in science? What direction do you see yourself taking in a professional career? I avoid expressing any preferences for academic over other careers. My aim for the student is a rewarding professional career, not producing more professors. Another habit is nudging students to taking increasing responsibility for their institutional activities as they complete their thesis. Another habit is my taking responsibility for risks to the student, ranging from the risk of poorly formed thesis questions, to health risks due to mould outbreaks at 4 Clark Place.   Supervisory habits of mine that I think lead to success with rapid completion times include:

-setting targets from discussion with students, rather than delivering deadlines
-fast turn-around on thesis drafts
-explaining the reasons for a particular revision of thesis, rather than making the revision.
In my view the track change feature in Word is antithetical to learning. I don't use it. Instead I use the Comment feature in Word to identify a problem by name. I'll provide one example of how to correct a named problem (*e.g.* dangling modifiers). Then each time the problem occurs, I name it, leaving it to the student to make the revision in their own words.

Finally, I take every opportunity to build student confidence. Science is far more daunting now than when I was a graduate student. The literature has grown exponentially, as have statistical techniques and technological sophistication. It's all I can do to keep up with it, let alone expect a student to master it on their own. Perpetual criticism (what about this? did you think of this?) strengthens science but by itself can destroy confidence and extinguish enthusiasm for science. So I make it a point to highlight and praise successes.

2b. Fostering Student and Research Staff Success in Research and Scholarship – Effectiveness

One measure of supervisory effectiveness is completed theses. The attached list (Appendix A) shows titles, completion dates, and professional activity after graduation, if known. In brief:

34 M.Sc. theses (13 co-supervised) 1995-2011.
 8 Ph.D. theses (4 co-supervised) 1995-2010.
23 Honours theses 1992-2011.
I have included honours theses because these are a supervisory activity more akin to graduate theses than to undergraduate teaching. The honours and Ph.D. theses were all in Biology. The Masters theses were from Biology and two interdisciplinary programs – Environmental Science and Cognitive and Behavioural Ecology. The diversity of thesis titles reflects a tendency on my

part to find a topic of interest to the student, rather than assigning a topic within the framework of my principal research focus, ecological scaling.

Another measure of effectiveness is publication with students and research staff. The attached list (Appendix B) shows full citation information, including title, journal, and publication date. In brief:

42 refereed publications
2 book chapters
10 lightly reviewed research documents
7 technical and administrative reports

Citation rates and journal rankings have not been included as they are somewhat beside the point, except in the case of students who are considering an academic career.

A measure of supervisory effectiveness, beyond the students that I have supervised, is service on thesis committees. The attached list (Appendix C) shows names, dates, academic programs, and in some cases, professional activity after graduation. In brief:

34 M.Sc. theses
23 Ph.D. theses

This service is clearly not the same as being a supervisor, and in my experience committee members vary considerably in their contribution, from substantial advice to almost nothing. My role on these committees was experimental or survey design and data analysis, and in some cases expertise on the topic. I gave advice along the way, read the theses, and contributed to revision of the thesis.

Another component of supervisory impact is frequency of service to the institution as thesis examiner or Ph.D. comprehensive examiner. The attached list (Appendix D) shows dates, names, degree, institution (Memorial or external), and program. In brief:

17 Ph.D. comprehensive exams
3 theses as external examiner
2 Ph.D. theses
1 M.Sc. thesis
29 theses as internal examiner
11 Ph.D. theses (Biology and Cognitive and Behavioural Ecology)
12 M.Sc. theses (Biology, CABE, Environmental Science, Geography)
2 Masters in Marine Studies
3 Masters in Applied Statistics
1 Masters in Environmental Science
5 Honours theses (Biology)

In these, as in supervising students, the manner of contribution depends on the degree. At the honours level we want to know if the student understood what they did. At the Master's level we look to solid science. At the comprehensive exam we probe whether the student is ready to undertake independent research. For the completed Ph.D. thesis we look to solid science and probe whether the student can make the leap from execution to posing do-able questions beyond what is known.

An important component of success as a supervisor, in the sciences, is fostering collaborative effort by thesis students and post-docs with research staff (from summer students to research assistants and research associates). Science is often represented to the public as the child of lone genius but in fact most of modern science rests on collaborative endeavor.. In my experience students, from honours to post-docs, are drawn to collaborative effort, where learning and

professional development occurs within the lab, often via more senior people, including staff. For new staff, joining a research group is an occasion for professional development and so I have listed research staff as relevant to fostering success in those supervised. I routinely encourage experienced staff to participate in the scientific life of the lab by explaining to students not only the how but the why of protocols and procedures that allow us to produce 'public knowledge' in the words of Bertrand Russell. This to me is an important part of the professional development of staff that I have supervised. The attached list (Appendix E) shows names and periods of employment of research staff, interns, and summer students. Briefly:

  3 research associates (RA III)
  2 senior research assistants (RA II)
 17 beginning research assistants (RA I)
  6 science technicians (non-students)
 20 Undergraduate summer technicians
 12 WISE summer students
  8 MUCEP students
  4 interns
 11 career placement interns

Most of these people worked and learned in a collaborative setting. The MUCEP students for the most part worked directly with me on defined projects, during the academic year.

    To me, meaningful indications of success as an academic supervisor are the gifts - framed artwork, mementos, and cards, some hand made, that sit in my office.

3a. Fostering Student and Research Staff Success in Their Profession – Style.

    When students and research staff move on from the university we wish them well and hope we have prepared them for professional life. My belief is that the best preparation we can give them is confidence in themselves, and in their professional preparation, along with exposure to collaborative science. My style has been to introduce young people to life as a professional in a collaborative setting – collaborative definition of objectives and tactics and working with others in a complex nexus of defined responsibilities. I have used external and internal funding to introduce students to professional life as it exists beyond the university, through internships, through programs such as the externally funded summer career program, and through experiential learning, notably the MUCEP and WISE programs as they have developed at Memorial.

    Former students and staff often ask me for recommendations, which is one way that I learn of their career progress. In each case I take the time to reflect on the student, identify their strengths and tendencies, and write a letter about those strengths and tendencies, using evidence from personal experience with that person.

    Professional success springs from clear communication, whether written (a thesis) or oral (often conjoined with visual presentation). I have consistently pushed students (and research staff) to present their work orally, right up to (but not beyond) the limit of comfort. I have made it a habit to fund M.Sc. and Ph.D. to at least one and often two presentations at professional conferences. I did this before the days that MUN had the funds to make any substantial contribution. I continue to fund the difference between what MUN can contribute and the cost of participation at more than one conference. I have invited former students to take the lead in making a presentation or writing a paper, where the invitation came to me.

For those students considering an academic career, professional development includes the practice of teaching. I have mentored 7 students in Memorial's Graduate Program in Teaching, from the inception of the program through 2011. The attached list (Appendix F) shows names and dates.

3b. Fostering Student and Research Staff Success in Their Profession – Effectiveness.
Students and research staff move on and so it is difficult to document their subsequent success. From time to time we encounter them, or hear with satisfaction that they have moved to some professional position. One measure of effectiveness is passage to a professionally rewarding position. Upon being nominated for this award, I assembled what I knew of former students, then undertook web searches, which enabled me to fill in a few blanks. What I know of professional activity by former students has been placed on the lists of thesis students and research staff (Appendices A, C, and E).
Another indication of effectiveness is continued professional contact after people move on. I have been lucky in that I have been able to continue to collaborate with former students and research staff (over a dozen) now at DFO in St. John's. And from time to time former students from outside the province contact me for advice on statistical analysis.

4.   Learning to be a Research Supervisor – Reflection and Action
It is an honor to be nominated for an award. I have been twice nominated for the President's Award in Teaching at Memorial, nominated for the Graduate Teaching Award by the Northeastern Association of Graduate Schools (awarded in 2005), nominated for the Dean of Science Distinguished Scholar Medal (awarded 2008), and now for the President's Award for Graduate and Post-Graduate Supervision. One of the high points of my academic career was traveling to Yale University to accept the NAGS Graduate Teaching Award.   In my view the honor of a nomination for a teaching or supervisory award is appropriately followed by an invitation to prepare a dossier, a structured document that begins with teaching or supervisory philosophy, describes execution in light of that philosophy, presents evidence of success, and includes a narrative of reflection and action that leads to better practice. In that spirit I have taken the time and effort to prepare a dossier, as if invited to do so.
As an academic supervisor, I am not now what I was when I began. I failed, often in predictable ways. I offer two narratives of failure, what I learned, and action taken to better my capacity as an academic supervisor.
The first narrative is a common problem for beginning supervisors – the perpetual re-write (Appendix G). People who make it to tenured positions ceaselessly revise. And from my experience, tend to revise a thesis as if there was only one path to best expression of research results. I learned the peril of ceaseless revision early on, from a talented Ph.D. student, who remarked in passing that comparison of drafts showed that I revised my earlier revisions. At that point I stopped revising student prose. Instead I learned the art of identifying the problem, showing the correction (once), then expecting the student to make the correction. The problem is endemic. A recent honours student described to me the experience of her friend, who because of ceaseless revision by her supervisor, no longer fully understood what became the written version of her thesis.
The second narrative is tied to co-supervision. My experience with co-supervisors is extensive and positive, but along the way I have learned that one needs to understand the strengths, motivations, and intellectual heritage of the co-supervisor. I learned that one needs to

let the student gravitate to one pole (M.Sc. students) of a co-supervisory arrangement, or work out their own path between the poles (Ph.D students) of two co-supervisors. I also learned, through hard experience, to avoid co-supervision with people who place their own advancement (publications) above the interests of the student (completion of a thesis in a timely fashion).

5. Educational Leadership

Academic supervision and the professional development of students and research staff occur in the institutional setting of the university. And so academic supervision, in a larger sense, includes administrative activity that fosters graduate student success in research and scholarship. My contributions here fall in two categories: offering workshops organized by DELTS Instructional Development Office, and serving as Associate Dean of Science, responsible for graduate student program delivery and funding arrangements in the Faculty of Science. An example of contribution in the first category is a workshop for graduate students and interested junior faculty (April 2008 ED2032B). The title of the workshop (The Graduate Supervisory Committee: An Insider's Guide) speaks for itself with regard to commitment to fostering student capacity and hence success. In the second category, I consistently promoted student participation in administrative activities that affected them, such as appointment of Chairs in the several Interdisciplinary Programs in the Faculty of Science. This included side sessions with the grad students elected to serve on a committee, to guide them on bringing the voice of graduate students into committee deliberations (briefly: consult widely among your fellow students; speak to students at the pizza lunch I'll organize for you; during committee meetings speak for graduate students from what you learn from consultation, not just your own experience)

6. Summary

Assembling the appendices for this dossier was at once daunting and heartening. Daunting because of the number of folders, one per person, that have accumulated in two file drawers over the years. Heartening because each folder brought to mind a person, the journey of discovery with that person, and recollection of success (and sometimes failure) in the art of fostering success as an academic supervisor. I wished that I had been able to list eventual professional activity for more of these young people, some of whom by now are mid-way in their careers. This dossier is a list of past contribution but it is also a list of future contribution, taken as the careers of the people listed in the following appendices.

Appendix A. Completed theses
Appendix B. Publications with students and research staff
Appendix C. Service on supervisory committees
Appendix D. Thesis examiner and comprehensive examiner
Appendix E. Supervision of research staff
Appendix F. Students mentored, Graduate Program in Teaching
Appendix G. Ceaseless revision