

From PostGrad to Professional: Useful tips for choosing and executing a doctoral thesis

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Nothing is more satisfying than standing on the starting block knowing that you have a backbone to take you through the race -- not a wishbone.

[David Wilke: Montreal Olympics 1976]

Abstract: The future of academic information systems will be shaped by doctoral students. Doctoral students need, therefore, to recognize that they -- not their supervisors or colleagues -- are in charge of their study, (Grover, 2001). The goal of this paper is to offer guidance to students on entering, surviving and flourishing during post-graduate study and beyond. I teach in the Information Systems and Technology department at the University of KwaZulu-Natal, and so much of the advice is addressed to this group, but others might find it useful. It is also rather South African-specific, but students elsewhere may find a useful idea or two.

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1. The skills

Students need to master certain skills as noted by Turner (1986). Students should understand the content and boundaries of knowledge in their field in order to formulate interesting questions for investigation and to permit the accumulation of knowledge. They also need to develop methodological skills to investigate these questions once they are identified. Doctoral students should keep in mind that one learns by acquiring experience in executing research. Also, students need the skills to present their research results in a clear and concise manner (Turner: 1986).

Lee (1997) argues that there are some things that doctoral students should be able to explain better, but other things that they cannot explain at all. One of the skills needed by a researcher is to note that a good inside strategy is to have a good outside strategy. Part of this outside strategy should be to have collegial responsibility to the program and other colleagues. There are some aspects of disadvantaged universities and Technikon that are more daunting than others, and finding a research topic is perhaps the biggest obstacle for most of these students. Westfall (2001) argues that students should design and package their research so that it will generate more impact outside the institution. This would influence relevance as well and the eventual final inspection of the thesis.

Grover (2001) argues that doctoral students are not politically astute. One of the skills of the doctoral student should be aware of is that the doctoral program involves a higher level of dependence on faculty. The problem is that some faculty tend to be parochial and egocentric. Students should be aware of this type of politics, otherwise they might be caught in the middle.

Students also need to keep in mind that IS research is influenced by multiple stakeholders with conflicting perspectives and should have the skill to make sense of this. Lee (1997) noted that students should ask: How much competition is there in your particular field? What relationship do you have with the faculty, the research customers, etc.? In other words, the student should have the skill to formulate and follow through with a research strategy.

2. Body of knowledge

The IS doctorate should be familiar with MIS research frameworks and the management of the knowledge frameworks. Universities and Technikons do not expect doctoral students to know everything. That is why they provide a starting list for these students. The student's body of knowledge should prepare him or her to teach, do research and interact with the community. The student must be aware that he/she will not

become an expert in everything (Davis, 1980)

3. The topic

Westfall (2001) notes that students should pick topics where academia has a competitive advantage over outside researchers. At the same time, these topics should be interesting and accessible to external stakeholders. However, he also noted that PhD students, in addition to having a great source of novel ideas, also represent a tremendous intellectual resource that can be enlisted to help solve problems that are truly relevant to the larger society.

Students should create synergy (Grover, 2001) that is, to have a breadth of knowledge in the field and create their own schema of key areas and their relationships. The topic should allow a student to start building depth in an area. By creating synergy between projects that require research, students can help facilitate the creation of a better thesis, help in time management, and possibly get a head start on a dissertation topic.

The characteristics of an ideal topic are to some extent incompatible:

- Westfall (2001) notes that students should ask: Is this a real and significant problem? The solution needs to make a difference for an identifiable group.
- Other factors to consider are: fundamental issues, simplified complex theories, anomalies, creation of new values and how it fits with current and future research (Alter and Dennis, 2002). This is an important decision about what to explore. It is the same for each doctoral student. The best approach is to design a framework and speculate on topic selection.
- The subject should be timely. Previous groundwork should leave your research problem ripe for completion, and it should be in an active area with potential for future work and employment. If a field is too crowded, and the subject too prominent, then you risk being "scooped" by a more experienced researcher who is able to work faster than you. In this case, you may be forced to start over again

(rather disastrous) or at least publish jointly (possibly a blessing, but surely an inconvenience).

- Concise theory is essential for all quantitative research. Doctoral students should remember that theory is the "why" of the phenomenon, not the "what" (Dennis and Valacich, 2001). An important point to remember is that theory can summarize prior research, but must go beyond the empirical data to explain why the data are the way they are. On the other hand, Benbasat and Weber (1996) noted many senior members of the IS discipline expound the virtues of reliance on reference disciplines.
- Your work should lead to a well-defined set of results to which you can lay claim. Also, will the results be interesting? In particular, employment prospects will be lessened if you merely complete a small piece of a very large project or piece of software that is closely identified with your supervisor, or is published with a long list of collaborators. On the other hand, it is impossible to work in a vacuum, and your task can be significantly harder if you don't have a group of people working on closely related problems with which you can interact and share code.
- The best research shows a high level of creativity -- and is often somewhat speculative. It is often unclear at first how the ideas will develop. On the other hand, a multi-layer plan of research is a valuable asset. Disseminate the results in such a way to reach the larger market.
- The topic should not be too ambitious. Students sometimes try to do too much and thereby spend too much time. The supervisor should try to narrow it down. Grover (2001) notes that the supervisor should help students evaluate their ambitious changes in terms of costs and benefits.
- The research design will always have a flaw in it somewhere. Dennis and Valacich (2001) argued that the best research designs, regardless of method, are those that accept their

limitations and play to their strength. Students should keep this in mind. The primary strength, according to them, is the ability to allow you to generalize the research.

- You should really enjoy the subject, and want to spend the next several years with it!

An ideal subject is of no use without a research supervisor who is willing to direct you in it. Clearly some compromise is necessary here! Also, students should remember that academic IS research can be useless largely because practitioners do not pay much attention to it (Truex, 2001)

4. Getting research ideas

4.1 Becoming an active reader and listener

Henderson (1986) (part of the Panel 6 as chaired by Turner) argued that students need to read critical reading lists by using take-home questions and gaining experience at the same time. It is important to make the transition from the passive mode of learning that traditional lecture courses encourage to an active and critical learning style. Jenkins (part of Panel 6 as chaired by Turner, 1986) noted that to attempt to solve the questions requires large amounts of time and frequently contributes little toward completion of a thesis. Whenever you read technical material, evaluate a piece of software, or listen to a research talk, ask yourself these canonical questions:

- From where did the author seem to draw the ideas?
- What exactly was accomplished by this piece of work?
- How does it seem to relate to other work in the field?
- What would be the reasonable next step to build upon this work?
- What ideas from related fields might be brought to bear upon this subject?

One technique that some find helpful is to keep a written log of your technical reading and listening. Review it periodically to see if some of the ideas begin to fit together.

4.2 Exposing yourself to research

Exposure to conducting research could be limited because of the students' lack of real experience in conducting research and the fuzzy definition of quality applied to research (Jenkins, Part of Panel 6 as chaired by Jon Turner, 1986). To overcome this lack of experience students need additional time such as research practicums, etc. Set aside some time every week for trying to generate research ideas. Some possible catalysts are:

- Make a weekly trip to the library to read at least the abstracts from the premier journals in your field. Choose an article or two to read in depth and critique.
- Make a weekly investigation to find technical reports in your field, using electronic resources or libraries. Read selectively and critique.
- Attend a research seminar or colloquium series. Listen and critique.

Add these to your log, and ask canonical questions. As you review the log six months from now, you may find something that strikes a chord then but is beyond you now.

4.3 Directed study

Which comes first: the research supervisor or the research topic? The answer is, either. If you have identified a compatible supervisor, you could ask for an independent study course. Both of you together set the focus for the course, with you having more or less input depending upon your progress in identifying a subfield of research.

4.4 Developing the germ of an idea

Once you have identified a topic that looks feasible, make sure you are aware of all of the literature in the area. Keep reading and listening, and keep distinct in your mind what is different between your work and others. If you do not frequently review the literature you read months ago, you may find yourself unconsciously claiming credit for other people's ideas. On the other hand, don't let another person's frame of mind limit your creativity.

4.5 A pitfall to avoid

It is possible to spend almost all of your time in literature review and seminars. It is

easy to convince yourself that by doing this you are working hard and accomplishing something. The truth of the matter is that nothing will come of it unless you are an active reader and listener and unless you assign yourself time to develop your own ideas, too. It is impossible to "finish a literature review and then start research." New literature is always appearing, and as your depth and breadth increase, you will continually see new collections and related areas that must be studied. Active listening and reading must be viewed as "continuing education" that will involve you for the rest of your career. Don't fool yourself into thinking it must be finished before you can begin research.

4.6 Choosing an Idea

From reading, interacting with your supervisor during independent study, or work on a research assistantship, some possible projects will emerge. Make a list of open problems and possible projects that are of interest to you, and discuss them with potential supervisors.

4.7 Supervisor

For many students, supervising means a support service for individual learners. Once the idea had been selected as it is important that you get an interim supervisor or approved supervisor at the time of registration. This should be a mutual agreement between student and faculty members and should be approved through the official channels. Should the working relationship turns sour, then it should be resolved as soon as possible or changes should be made.

The supervisor should advise you on rules and procedures, should have meetings, be knowledgeable and help with time management. The supervisor should also be able to advise you on the examination process that you will have to go through. Mullins and Kiley (2002) argue that many supervisors are poorly placed to refute anecdotes as often they are able only to speak from their own, sometimes narrow, experience. Doctoral supervision is an advanced form of education and students should keep in mind that its purpose is to encourage intellectual and professional growth in the student. All of this requires serious commitment on the part of the supervisor.

5. Remain active

Even after you have decided on your initial focus, it is important to continue a routine of reading new journals and technical reports and attending seminars. All of these sources can contribute to the development of your idea. At this stage you can add one question to the canonical list: How can these ideas help me solve my research problem?

Remember that often the initial idea is quite far from the final research topic. If you remain active in reading and listening, it will be much easier to generate alternative topics if the time comes. Most students find that doing the research is the most challenging part at disadvantaged universities and Technikon. They often budget their time to allow a very short period for the actual writing of the research.

This plan invariably leads to an unpleasant surprise: writing can be a very slow process! Here are some of the often unanticipated reasons:

- In order to get a well-written paper, the first two or three drafts must often be completely discarded!
- You might not have new ways to apply to existing science or theories.
- In the course of your several years of research, you have probably changed notation several times, developed new points of view on your work, and developed many results that looked significant at the time but now seem to contribute nothing toward your final product. Sorting through all of your work and reorganizing is a lengthy process. It could also lengthen your stay at the university or Technikon (Jenkins, Panel 6 as chaired by Turner, 1986). It usually takes a minimum of two years to complete but most candidates require three to five years (Remenyi and Money, 1997).
- Even if you have several technical reports, conference papers or journal articles discussing partial results, the audience for your research is different, and thus the method of exposition must be significantly changed. A research paper is addressed to a group of experts in the field, who presumably

know the literature and the background issues quite well. A thorough literature review must be included, as well as an evaluation of where your work fits into the scheme of things.

- All the small details that were put off and forgotten must now be filled in. Citations must be checked, the historical progression of various results must be carefully documented, the "trivial cases" must be worked through, and the documentation of your methods must be complete. Your research supervisor will probably have strong opinions on how the work should be presented. Adapting your style to these requirements will take some flexibility and thought.
- Your faculty members, your first detached readers, will often find undefined jargon or symbols, holes in your arguments (or at least in your presentation of them), and other deficiencies. Jenkins (part of Panel 6 as chaired by Turner, 1986) argues that the feedback students receive on their topic analysis from various faculties does little to help crystallize the students' concept of quality.
- Even after you are on track, you will probably find that a "good" day of writing produces about two pages, leading to an overall average of perhaps a quarter page per day.

6. How can you minimize the pain of writing?

Some of the more successful students take the time to build an evolving reference set, read copiously and seek opportunities to work with colleagues and faculty (Grover, 2001). Students must watch out, however, because students noted for their competence and motivation tend to get more demands on their time from their colleagues and faculty and this takes away the time to write. Some habits begun early in your research will help:

- Keep careful notes about your work. You might choose to keep bound logbooks (square ruled paper is helpful) or online notes. Write your notes regularly: write up every new result, but make an entry at least weekly even if you believe that

nothing of significance has been accomplished. Even noting what you are thinking about can be helpful.

- If possible, write up each piece of the work for publication as it is completed. This makes the final writing easier because each piece is documented at its completion time rather than months or years later, and the early write-ups give a basis for organizing the research. In addition, it establishes your reputation early and makes the job search much easier.
- As you read other research and published works, be a student of technical writing styles. Find out what works and what doesn't. Study a good writing manual.
- Watch out that you do not fall in a lull period (Grover, 2001). Students sometimes take a break and one month becomes two, then three and eventually the supervisor loses interest. Then it is a slow process getting back into the dissertation mode.
- Keep the following in mind when you compile your thesis. It should have elegance of design, be creative and all should fit together. In other words, it should be a well-sculpted piece of work.

Students should keep the above in mind and ensure that they can do a proper reference citation. I have seen many proposals and theses that contain spelling errors because students did not have it spell-checked or proofread by an expert. My motto has always been to check, re-check and double-check.

A student who has developed skill at writing non-technical term papers as an under-graduate will have an easier time of learning to be a good technical writer, but there is one additional skill that must be added: you must also be a good learner! On the other hand, Armstrong (1980) argued in his paper that articles that were more difficult to read were rated higher in prestige by academics. He discovered that clear communication of doctoral and other research is not appreciated. Armstrong concludes his article by noting faculty are impressed by less readable articles and noted that, "If you can't convince them, confuse them."

When you write a term project, you are explaining the work of others. You have a good idea of what is immediately obvious and what is more difficult to grasp, since you recently went through the exercise of grasping the material yourself.

It is easy to be fooled into thinking that since something is now obvious to you after several years of study; it is also obvious to your reader. The most difficult part of research writing is organizing and presenting your material in an understandable way. An important early step is to develop a tentative outline. The outline will probably change several times, but it is important always to have a current one foremost in your mind so that you can make the pieces fit together smoothly.

Recapitulate what has been accomplished and discuss ideas for future work. Don't think that the research must be written starting at page 1 and continuing until the end. Most often, the presentation of the "big ideas" shapes the presentation of "the problem." The introduction is often written (or at least rewritten) last. The important thing is to jump in and to begin writing something, and make notes along the way of how other sections need to be adapted so that they all work together.

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