
Chapter 18. The Masters/PhD Thesis

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The Masters/PhD Thesis

The basic requirements of a Masters degree are to show that one has mastered research methods and techniques, that one is familiar with the state of the art in a particular field, and that one is able to apply those research methods in creating, improving or analyzing state of the art systems. Originality and significant contribution to knowledge are only required for PhD degrees, although most Masters theses contain some aspects that are original. In many universities, particularly in South Africa, the distinction between Masters and PhD theses has become blurred, as the standard of Masters theses grows higher.

Steps in Obtaining a Thesis

The following are the major steps involved in thesis work:

1. Select a suitable university and department
2. Choose a supervisor and research topic
3. Arranging funding for your studies
4. Read the literature and decide on a research question to tackle
5. Choose appropriate research methods and secondary goals, and produce a project plan
6. Write the thesis proposal
7. Conduct the research, writing up as you proceed and revising the project plan as needed
8. Produce progress reports, papers, presentations and other deliverables as and when required by the university and funding bodies
9. At the completion of the research, complete and submit the thesis document for examination
10. If required by the university, undergo a thesis defence or other form of oral examination on the work
11. Where required, make corrections or extend the research as suggested by the examiners.

Most of these activities have been described in previous sections. Those peculiar to thesis work are discussed below.

Choosing a Supervisor

When choosing a supervisor, consider their level of expertise, knowledge and research experience in your problem area; their supervision style and their personality. Greater expertise on the part of your supervisor will not only improve your research productivity and quality, it will also help your confidence and general peace of mind. A supervisor should have some knowledge of the area being researched, be familiar with the research process, and have adequate skills to oversee, guide and encourage the student or junior.

Supervision Style

In considering supervision style, ask yourself what type of contact you prefer (someone who keeps regular tabs on you at the one extreme, someone with a laissez faire attitude who has limited time for supervision, or what between these two extremes suits you best), how much pressure you work best with, and whether you will be helped or hindered by any individual characteristics or methods of a potential supervisor (e.g. if he/she is known to require frequent presentation of research progress to large groups, etc.)

In choosing a supervisor you also need to know yourself, to know whether their supervision style will be beneficial for you. Do you prefer to work alone or in a group? Do you prefer the firm hand and watchful eye of someone who oversees your work because you perform best under pressure, or value the freedom to work at your own pace under someone who respects your independence? Do you prefer a supervisor who continually challenges your ideas and extends you to the limit, or one with a gentler, supportive nature? Would you rather contribute to an established research project, or start a new, individual piece of work?

Investigative Work

The ideal supervisor is an expert in the field that interests you and is actively engaged in good research in that area, working with a good team of happy, well-motivated students and collaborators, globally known and respected for his/her ideas, with a personality that suits your own. Finding such a person, or coming close to it, requires good research in its own right! Look at the research record and thesis offerings of potential supervisors at a number of departments; meet the supervisors and their students, attend their research meetings and seminars, ask about supervision style, and find out graduate throughput and dropout rates. Try to ask current thesis students how much their supervisor assisted with literature searches, finding a topic, solving problems, introducing them to others, and so forth. If you have an idea for a research question to tackle, write this up and ask for comments.

Changing Supervisor

Once you have chosen a supervisor and started your thesis, do not feel obligated to remain with that supervisor if you are unhappy with him or her. In particular, if you feel that person is hardly ever available for consultation, shows no personal interest in the project, has inadequate knowledge, fails to give constructive criticism or treats you badly (being rude, negative, sexist, racist, exploitative, or harassing you), speak to them frankly and calmly about the problem, and if this fails to help then look for another supervisor.

It is best to heed warning signals of the above kind early on, when changing supervisor will have less impact on your progress. Be wary of a supervisor who gives you too much freedom in choosing your topic; such a person is likely to lack the background to help you adequately. Likewise, a supervisor who cannot point you to some good papers with which to begin your literature search, is probably not qualified to help you on that specific topic. Finally, remember that students should also behave in a

way that encourages a good working relationship with their supervisor - communicate well, follow advice, be honest, attend meetings, and work independently.

Choosing a Thesis Topic

Finding a thesis topic is the first difficulty encountered by most students. A fairly easy way of narrowing down this problem is to list the potential supervisors and their research fields - eliminating anyone whose supervision style or research area is not appealing. Some reading into the topics on this list is then advisable, after which the best candidate field or fields should be selected. It will help to find a topic within this field by writing down at this stage what one finds interesting and why - both as explicitly as possible. Supervisor and student can then work together until a specific research question/task is decided upon.

The research question(s) you are addressing should:

- Indeed be unsolved, or solved only under certain assumptions
- Lend itself to good theoretical work or good empirical results (or both)
- Be significant and of interest to other researchers
- Not require more time than you have, or at least have a core that is manageable

If you choose a topic that is clearly defined, narrow and focused, you can start sooner and are less likely to go off at a tangent down a path that proves fruitless or uninteresting. It will also be easier for you to plan and evaluate your research, and you will spend less time worrying about convincing examiners that your work is worthy of the degree.

Pitfalls to Avoid

Beware of taking risks when setting your research goal. If it is your own idea and you struggle to convince your supervisor that it is suitable, be aware that you will probably struggle even more to convince others in the field, including your examiners and reviewers of your papers. If your work concerns something very different from what others in your department are interested in and actively researching, it will be harder to get feedback and help.

Do not choose a goal that is too ambitious. For some who are very enthusiastic and confident, this can be very difficult - so heed carefully the advice of your supervisor if this is to cut down the task or find something less complex or risky. Remember that many papers you read are the work of large research teams or the product of many years' effort, and of people with research experience far greater than your own. Furthermore, many authors have a knack of marketing their research very well, so that the reader has the impression of a much grander accomplishment than is indeed the case (bear this in mind when you read, and when you discuss papers with your supervisor, team members or reading group). It is better to look at recent dissertations passed by your institution to get an idea of what is expected.

The Thesis Proposal

Once you have decided your research question or goal, write up a thesis proposal -whether or not it is required by your department - and give it to your supervisor and others for comment. This will take several months, as you need to familiarize yourself adequately with the problem/task, with existing research that is relevant to it, and with appropriate research methods (so that you can identify these and explain how they will be applied). You must be able to define the problem or task clearly and come up with a methodology and plan for tackling it within a reasonable time. The more detail you can show, the better quality feedback you will receive; and remember to write for an audience who are not involved in the same research field. Once your proposal is written, give a talk to present it to fellow students and staff - whether or not this is the normal practice in your department.

Financial Aid

Make sure that you have enough funding to be able to devote sufficient time to your thesis without having to worry about finance, or waste time with part-time work. If you have a reasonable lifestyle and find that you are struggling to survive on the funding you are receiving, speak to your supervisor and others in your department; usually arrangements can be made to help, and if it does require doing other work, this is likely to be more appropriate and suitable for your context, e.g. research or teaching assistant-ships. Do your financial planning in good time, so that when such RA and TA positions are offered, you are among the applicants - these are unlikely to be vacated until a year's time (or perhaps a semester's time) in most institutions. Speak to graduate students and staff in your department, and in the Post-Graduate Administration section of your university, to make sure that you are aware of all the funding opportunities in good time. If you can, try to earn money as a research assistant prior to commencing your thesis studies; this has the extra advantage of giving you valuable insight and experience in the field and in research techniques, as well as a taste of the working style of potential supervisors.

Writing the Thesis

Do not think of a thesis as comprising two main stages, research and dissertation writing, as these must proceed in parallel. Many ideas are incorrect or incompletely formulated before being tested, and writing them down first helps significantly to improve and clarify the ideas, saving a great deal of time when they are subsequently implemented or tested.

Motivation

The more motivated you are to do research, the higher your chance of success. As with all research, thesis work involves both exciting times and frustrating times. When progress seems too slow, or ideas fail, it becomes hard to continue working. This section offers some tips for staying motivated when the going gets tough.

Firstly, do not try to do your thesis research entirely by yourself. Do it with your supervisor - have regular meetings, seek his/her advice and guidance, and check your progress (or lack of progress) with him/her. This will not only reduce the time spent, but also make the entire experience a much happier one.

If your degree is part-time, do not be tempted to take leave of absence from work at the beginning, even though the time spent choosing a research question or goal can be considerable. The best time to take leave is when you are producing the final dissertation draft, as this is when you need to concentrate your thinking and to maximize the number of hours spent daily on your thesis.

Motivation when Reading

Much of one's research time is spent reading, particularly in the beginning. Most MSc students spend their first few months reading; PhD students typically take 6 - 12 months familiarizing themselves with the field so that they can confidently find an open problem or novel approach to a task. At first, most students feel overwhelmed and despondent because of the amount of material to read and the slow rate at which they are able to assimilate documents. But you are not meant to read every relevant article; with practice you will learn how to distinguish those that are important - aim to read these, along with recent papers and papers that are highly relevant. And as your knowledge grows, so will the rate at which you can read and understand other work.

If, during the course of your work, you find a paper that reports almost exactly what you are attempting, do not be too despondent. Read it carefully, along with others in the field such as a supervisor, colleague or collaborator. Contact the authors and talk to them (by email if necessary, but preferably face to face). You may find that there are interesting differences, or that there are still alternatives or

extensions for you to pursue. You can end up gaining a great deal from interaction with the author(s), who are clearly kindred souls, and if you are lucky it may even lead to collaboration in the future.

Some Final Tips to Help You Stay on Course

- If you are hating what you are working on, do not be afraid to change your thesis topic or direction to something of greater personal interest
- Focus on the skills you will learn, rather than the research outputs
- Incorporate in the project the gaining of some knowledge or experience of direct relevance to you
- Concentrate on the reward(s) that will follow the qualification of MSc/PhD, such as publication/s, travel, a new job, promotion, enhanced status, etc.
- Talk to someone sympathetic who can support and encourage you, such as a fellow student or a friend outside the department
- Do not expect too much of yourself (don't set unrealistic milestones or expect to work more hours per day than you can reasonably manage)
- Concentrate on what has been achieved, rather than being negative about what has not been done
- Break down every hard task into small sub-tasks, even when considering what you plan to achieve each day
- Look at your early notes and plans to see how much has already been learnt and how much progress you have already made
- Remember that research is about breaking new ground, so problems and setbacks are to be expected - see them as confirmation that the task you are tackling is sufficiently hard to qualify as good thesis material