How to Write a PhD Thesis

some notes by
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Spanish version: CÛmo escribir una tesis de doctorado

French version: Comment rediger une thèse

This guide to thesis writing gives some simple and practical advice on the problems of getting started, getting organized, dividing the huge task into less formidable pieces and working on those pieces. It also explains the practicalities of surviving the ordeal. It includes a suggested structure and a guide to what should go in each section. It was originally written for graduate students in physics, and most of the specific examples given are taken from that discipline. Nevertheless, the feedback from users indicates that it has been consulted and appreciated by graduate students in diverse fields in the sciences and humanities.

Getting Started

When you are about to begin, writing a thesis seems a long, difficult task. That is because it is a long, difficult task. Fortunately, it will seem less daunting once you have a couple of chapters done. Towards the end, you will even find yourself enjoying it---an enjoyment based on satisfaction in the achievement, pleasure in the improvement in your technical writing, and of course the approaching end. Like many tasks, thesis writing usually seems worst before you begin, so let us look at how you should make a start.

An outline

First make up a thesis outline: several pages containing chapter headings, sub-headings, some figure titles (to indicate which results go where) and perhaps some other notes and comments. There is a section on chapter order and thesis structure at the end of this text. Once you have a list of chapters and, under each chapter heading, a reasonably complete list of things to be reported or explained, you have struck a great blow against writer's block. When you sit down to type, your aim is no longer a thesis---a daunting goal---but something simpler. Your new aim is just to write a paragraph or section about one of your subheadings. It helps to start with an easy one: this gets you into the habit of writing and gives you self-confidence. Often the Materials and Methods chapter is the easiest to write---just write down what you did; carefully, formally and in a logical order.

How do you make an outline of a chapter? For most of them, you might try the method that I use for writing papers, and which I learned from my thesis adviser: assemble all the figures that you will use in it and put them in the order that you would use if you were going to explain to someone what they all meant. You might as well rehearse explaining it to someone else---after all you will probably give several talks based on your thesis work. Once you have found the most logical order, note down the the key words of your explanation. These key words provide a skeleton for much of your chapter outline.

Once you have an outline, discuss it with your adviser. This step is important: s/he will have useful suggestions, but it also serves notice that s/he can expect a steady flow of chapter drafts that will make high priority demands on his/her time. Once you and your adviser have agreed on a logical structure, s/he will need a copy of this outline for reference when reading the chapters which you will probably present out of order. If you have a co-adviser, discuss the outline with him/her as well, and present all chapters to both advisers for comments.

Organisation

It is encouraging and helpful to start a filing system. Open a word-processor file for each chapter *and one for the references.* You can put notes in these files, as well as text. While doing something for Chapter n, you will think "Oh I must refer back to/discuss this in Chapter m" and so you put a note to do so in the file for Chapter m. Or you may think of something interesting or relevant for that chapter. When you come to work on Chapter m, the more such notes you have accumulated, the easier it will be to write.

Make a back-up of these files and do so every day at least (depending on the reliability of your computer and the age of your disk drive). Do not keep back-up disks close to the computer in case the hypothetical thief who fancies your computer decides that s/he could use some disks as well.

A simple way of making a remote back-up is to send it as an email attachment to a consenting email correspondent, preferably one in a different location. You could even send it to yourself if your server saves your mail (in some email packages like Eudora this is an optional setting). In either case, be careful to dispose of superseded versions so that you don't waste disk space, especially if you have bitmap images or other large files.

You should also have a physical filing system: a collection of folders with chapter numbers on them. This will make you feel good about getting started and also help clean up your desk. Your files will contain not just the plots of results and pages of calculations, but all sorts of old notes, references, calibration curves, suppliers' addresses, specifications, speculations, letters from colleagues etc., which will suddenly strike you as relevant to one chapter or other. Stick them in that folder. Then put all the folders in a box or a filing cabinet. As you write bits and pieces of text, place the hard copy, the figures etc in these folders as well. Touch them and feel their thickness from time to time---ah, the thesis is taking shape.

If any of your data exist only on paper, copy them and keep the copy in a different location. Consider making a copy of your lab book. This has another purpose beyond security: usually the lab book stays in the lab, but you may want a copy for your own future use. Further, scientific ethics require you to keep lab books and original data for at least ten years, and a copy is more likely to be found if two copies exist.

While you are getting organised, you should deal with any university paperwork. Examiners have to be nominated and they have to agree to serve. Various forms are required by your department and by the university administration. Make sure that the rate limiting step is your production of the thesis, and not some minor bureaucratic problem.

A note about word processors

Commercial word processors have gradually become bigger, slower, less reliable and harder to use as they acquire more features. This is a general feature of commerical software and an

important input to Moore's Law. If software and operating performance did not deteriorate, people would not need to buy new computers and profits would fall for makers of both hard- and soft-ware. Software vendors want it to look fancy and obvious in the demo, and they don't really care about its ease, speed and reliability to an expert user because the expert user has already bought it. For example, it is much faster to type equations and to do formatting with embedded commands because you use your fingers independently rather than your hand and because your fingers don't leave the keyboard. However, click-on menus, however slow and cumbersome, look easy to use in the shop.

LaTeX is powerful, elegant, reliable, fast and *free* from http://www.latex-project.org/ or http://www.miktex.org/. An alternative is to use old versions of commercial software. Word 5 allows equations to be typed without touching the mouse and is as fast in this respect as LaTeX. Sites exist to provide discontinued software to people who are interested in speed and reliability, but, not knowing the legality of what they do, I shaln't link to them.

A timetable

I strongly recommend sitting down with the adviser and making up a timetable for writing it: a list of dates for when you will give the first and second drafts of each chapter to your adviser(s). This structures your time and provides intermediate targets. If you merely aim "to have the whole thing done by (some distant date)", you can deceive yourself and procrastinate more easily. If you have told your adviser that you will deliver a first draft of chapter 3 on Wednesday, it focuses your attention.

You may want to make your timetable into a chart with items that you can check off as you have finished them. This is particularly useful towards the end of the thesis when you find there will be quite a few loose ends here and there.

Iterative solution

Whenever you sit down to write, it is very important to write *something.* So write something, even if it is just a set of notes or a few paragraphs of text that you would never show to anyone else. It would be nice if clear, precise prose leapt easily from the keyboard, but it usually does not. Most of us find it easier, however, to improve something that is already written than to produce text from nothing. So put down a draft (as rough as you like) for your own purposes, then clean it up for your adviser to read. Word-processors are wonderful in this regard: in the first draft you do not have to start at the beginning, you can leave gaps, you can put in little notes to yourself, and then you can clean it all up later.

Your adviser will expect to read each chapter in draft form. S/he will then return it to you with suggestions and comments. *Do not be upset if a chapter---especially the first one you write---returns covered in red ink.* Your adviser will want your thesis to be as good as possible, because

his/her reputation as well as yours is affected. Scientific writing is a difficult art, and it takes a while to learn. As a consequence, there will be many ways in which your first draft can be improved. So take a positive attitude to all the scribbles with which your adviser decorates your text: each comment tells you a way in which you can make your thesis better.

As you write your thesis, your scientific writing is almost certain to improve. Even for native speakers of English who write very well in other styles, one notices an enormous improvement in the first drafts from the first to the last chapter written. The process of writing the thesis is like a course in scientific writing, and in that sense each chapter is like an assignment in which you are taught, but not assessed. Remember, only the final draft is assessed: the more comments your adviser adds to first or second draft, the better.

Before you submit a draft to your adviser, run a spell check so that s/he does not waste time on those. If you have any characteristic grammatical failings, check for them.

What is a thesis? For whom is it written? How should it be written?

Your thesis is a research report. The report concerns a problem or series of problems in your area of research and it should describe what was known about it previously, what you did towards solving it, what you think your results mean, and where or how further progress in the field can be made. Do not carry over your ideas from undergraduate assessment: a thesis is not an answer to an assignment question. One important difference is this: the reader of an assignment is usually the one who has set it. S/he already knows the answer (or one of the answers), not to mention the background, the literature, the assumptions and theories and the strengths and weaknesses of them. The readers of a thesis do not know what the "answer" is. If the thesis is for a PhD, the university requires that it make an original contribution to human knowledge: your research must discover something hitherto unknown.

Obviously your examiners will read the thesis. They will be experts in the general field of your thesis but, on the exact topic of your thesis, you are the world expert. Keep this in mind: you should write to make the topic clear to a reader who has not spent most of the last three years thinking about it.

Your thesis will also be used as a scientific report and consulted by future workers in your laboratory who will want to know, in detail, what you did. Theses are occasionally consulted by people from other institutions, and the library sends microfilm versions if requested (yes, still). More and more theses are now stored in an entirely digital form (i.e. the figures as well as the text are on a disk). A consequence of this is that your thesis can be consulted much more easily by researchers around the world. Write with these possibilities in mind.

It is often helpful to have someone other than your adviser(s) read some sections of the thesis, particularly the introduction and conclusion chapters. It may also be appropriate to ask other members of staff to read some sections of the thesis which they may find relevant or of interest, as they may be able to make valuable contributions. In either case, only give them revised versions, so that they do not waste time correcting your grammar, spelling, poor construction or presentation.

How much detail?

The short answer is: rather more than for a scientific paper. Once your thesis has been assessed and your friends have read the first three pages, the only further readers are likely to be people who are seriously doing research in just that area. For example, a future research student might be pursuing the same research and be interested to find out exactly what you did. ("Why doesn't the widget that Bloggs built for her project work any more? Where's the circuit diagram? I'll look up her thesis." "Blow's subroutine doesn't converge in my parameter space! I'll have to look up his thesis." "How did that group in Sydney manage to get that technique to work? I'll order a microfilm of that thesis they cited in their paper.") For important parts of apparatus, you should include workshop drawings, circuit diagrams and computer programs, usually as appendices. (By the way, the intelligible annotation of programs is about as frequent as porcine aviation, but it is far more desirable. You wrote that line of code for a reason: at the end of the line explain what the reason is.) You have probably read the theses of previous students in the lab where you are now working, so you probably know the advantages of a clearly explained, explicit thesis and/or the disadvantages of a vague one.

Make it clear what is yours

If you use a result, observation or generalisation that is not your own, you must usually state where in the scientific literature that result is reported. The only exceptions are cases where every researcher in the field already knows it: dynamics equations need not be followed by a citation of Newton, circuit analysis does not need a reference to Kirchoff. The importance of this practice in science is that it allows the reader to verify your starting position. Physics in particular is said to be a vertical science: results are built upon results which in turn are built upon results etc. Good referencing allows us to check the foundations of your additions to the structure of knowledge in the discipline, or at least to trace them back to a level which we judge to be reliable. Good referencing also tells the reader which parts of the thesis are descriptions of previous knowledge and which parts are your additions to that knowledge. In a thesis, written for the general reader who has little familiarity with the literature of the field, this should be especially clear. It may seem tempting to leave out a reference in the hope that a reader will think that a nice idea or an nice bit of analysis is yours. I advise against this gamble. The reader will probably think: "What a nice idea---I wonder if it's original?". The reader can probably find out via the library, the net or even just from a phone call.

If you are writing in the passive voice, you must be more careful about attribution than if you are writing in the active voice. "The sample was prepared by heating yttrium..." does not make it clear whether you did this or whether Acme Yttrium did it. "I prepared the sample..." is clear.

Style

The text must be clear. Good grammar and thoughtful writing will make the thesis easier to read. Scientific writing has to be a little formal---more formal than this text. Native English speakers should remember that scientific English is an international language. Slang and informal writing will be harder for a non-native speaker to understand.

Short, simple phrases and words are often better than long ones. Some politicians use "at this point in time" instead of "now" precisely because it takes longer to convey the same meaning. They do not care about elegance or efficient communication. You should. On the other hand, there will be times when you need a complicated sentence because the idea is complicated. If your primary statement requires several qualifications, each of these may need a subordinate clause: "When [qualification], and where [proviso], and if [condition] then [statement]". Some lengthy technical words will also be necessary in many theses, particularly in fields like biochemistry. Do not sacrifice accuracy for the sake of brevity. "Black is white" is simple and catchy. An advertising copy writer would love it. "Objects of very different albedo may be illuminated differently so as to produce similar reflected spectra" is longer and uses less common words, but, compared to the former example, it has the advantage of being true. The longer example would be fine in a physics thesis because English speaking physicists will not have trouble with the words. (A physicist who did not know all of those words would probably be glad to remedy the lacuna either from the context or by consulting a dictionary.)

Sometimes it is easier to present information and arguments as a series of numbered points, rather than as one or more long and awkward paragraphs. A list of points is usually easier to write. You should be careful not to use this presentation too much: your thesis must be a connected, convincing argument, not just a list of facts and observations.

One important stylistic choice is between the active voice and passive voice. The active voice ("I measured the frequency...") is simpler, and it makes clear what you did and what was done by others. The passive voice ("The frequency was measured...") makes it easier to write ungrammatical or awkward sentences. If you use the passive voice, be especially wary of dangling participles. For example, the sentence "After considering all of these possible materials, plutonium was selected" implicitly attributes consciousness to plutonium. This choice is a question of taste: I prefer the active because it is clearer, more logical and makes attribution simple. The only arguments I have ever heard for avoiding the active voice in a thesis are (i) many theses are written in the passive voice, and (ii) some very polite people find the use of "I" immodest. Use the first person singular, not plural, when reporting work that you did yourself: the editorial 'we' may suggest that you had help beyond that listed in your aknowledgements, or it may suggest that you are trying to share any blame. On the other hand, retain plural verbs for

"data": "data" is the plural of "datum", and lots of scientists like to preserve the distinction. Just say to yourself "one datum is ..", "these data are.." several times. An excellent and widely used reference for English grammar and style is *A Dictionary of Modern English Usage* by H.W. Fowler.

Presentation

There is no need for a thesis to be a masterpiece of desk-top publishing. Your time can be more productively spent improving the content than the appearance.

In many cases, a reasonably neat diagram can be drawn by hand faster than with a graphics package. Either is usually satisfactory. The computer-generated figure has the advantage that it can be stored in the text and transmitted electronically, but this advantage disappears if you are not going to store your thesis as a file for transmission. You can scan a hand drawn figure. As a one bit, moderate resolution graphic, it will probably not be huge, but it will still be bigger than a line drawing generated on a graphics package.

In general, students spend too much time on diagrams---time that could have been spent on examining the arguments, making the explanations clearer, thinking more about the significance and checking for errors in the algebra. The reason, of course, is that drawing is easier than thinking.

I do not think that there is a strong correlation (either way) between length and quality. There is no need to leave big gaps to make the thesis thicker. Readers will not appreciate large amounts of vague or unnecessary text.

Approaching the end

A deadline is very useful in some ways. You must hand in the thesis, even if you think that you need one more draft of that chapter, or someone else's comments on this section, or some other refinement. If you do not have a deadline, or if you are thinking about postponing it, please take note of this: *A thesis is a very large work. It cannot be made perfect in a finite time*. There will inevitably be things in it that you could have done better. There will be inevitably be some typos. Indeed, by some law related to Murphy's, you will discover one when you first flip open the bound copy. No matter how much you reflect and how many times you proof read it, there will be some things that could be improved. There is no point hoping that the examiners will not notice: many examiners feel obliged to find some examples of improvements (if not outright errors) just to show how thoroughly they have read it. So set yourself a deadline and stick to it. Make it as good as you can in that time, and then hand it in! (In retrospect, there was an advantage in writing a thesis in the days before word processors, spelling checkers and typing programs. Students often paid a typist to produce the final draft and could only afford to do that once.)

How many copies?

Talk to your adviser about this. As well as those for the examiners, the university libraries and yourself, you should make some distribution copies. These copies should be sent to other researchers who are working in your field so that:

- they can discover what marvellous work you have been doing before it appears in journals;
- they can look up the fine details of methods and results that will or have been published more briefly elsewhere;
- they can realise what an excellent researcher you are. This realisation could be useful if a post- doctoral position were available in their labs. soon after your submission, or if they were reviewers of your research/post-doctoral proposal. Even having your name in their bookcases might be an advantage.

Whatever the University's policy on single or double-sided copies, the distribution copies could be double-sided so that forests and postage accounts are not excessively depleted by the exercise. Your adviser could help you to make up a list of interested and/or potentially useful people for such a mailing list. Your adviser might also help by funding the copies and postage if they are not covered by your scholarship.

The following comment comes from Marilyn Ball of the Australian National University in Canberra: "When I finished writing my thesis, a postdoc wisely told me to give a copy to my parents. I would never have thought of doing that as I just couldn't imagine what they would do with it. I'm very glad to have taken that advice as my parents really appreciated receiving a copy and proudly displayed it for years. (My mother never finished high school and my father worked with trucks - he fixed 'em, built 'em, drove 'em, sold 'em and junked 'em. Nevertheless, they enjoyed having a copy of my thesis.)"

Personal

In the ideal situation, you will be able to spend a large part---perhaps a majority---of your time writing your thesis. This may be bad for your physical and mental health.

Typing

Set up your chair and computer properly. The Health Service, professional keyboard users or perhaps even the school safety officer will be able to supply charts showing recommended relative heights, healthy postures and also exercises that you should do if you spend a lot of time at the keyboard. These last are worthwhile insurance: you do not want the extra hassle of back or neck pain. Try to intersperse long sessions of typing with other tasks, such as reading, drawing, calculating, thinking or doing research.

If you do not touch type, you should learn to do so for the sake of your neck as well as for

productivity. There are several good software packages that teach touch typing interactively. If you use one for say 30 minutes a day for a couple of weeks, you will be able to touch type. By the time you finish the thesis, you will be able to touch type quickly and accurately and your six hour investment will have paid for itself. Be careful not to use the typing exercises as a displacement activity.

Exercise

Do not give up exercise for the interim. Lack of exercise makes you feel bad, and you do not need anything else making you feel bad while writing a thesis. 30-60 minutes of exercise per day is probably not time lost from your thesis: I find that if I do not get regular exercise, I sleep less soundly and longer. How about walking to work and home again? (Walk part of the way if your home is distant.) Many people opine that a walk helps them think, or clears the head. You may find that an occasional stroll improves your productivity.

Food

Do not forget to eat, and make an effort to eat healthy food. You should not lose fitness or risk illness at this critical time. Exercise is good for keeping you appetite at a healthy level. I know that you have little time for cooking, but keep a supply of fresh fruit, vegetables and bread. It takes less time to make a sandwich than to go to the local fast food outlet, and you will feel better afterwards.

Drugs

Thesis writers have a long tradition of using coffee as a stimulant and alcohol or marijuana as relaxants. (Use of alcohol and coffee is legal, use of marijuana is not.) Used in moderation, they do not seem to have ill effects on the quality of thesis produced. Excesses, however, are obviously counter-productive: several expressi and you will be buzzing too much to sit down and work; several drinks at night will slow you down next day.

Others

Other people will be sympathetic, but do not take them for granted. Spouses, lovers, family and friends should not be undervalued. Spend some time with them and, when you do, have a good time. Do not spend your time together complaining about your thesis: they already resent the thesis because it is keeping you away from them. If you can find another student writing a thesis, then you may find it therapeutic to complain to each other about advisers and difficulties. S/he need not be in the same discipline as you are.

Coda

Keep going---you're nearly there! Most PhDs will admit that there were times when we thought about reasons for not finishing. But it would be crazy to give up at the writing stage, after years of work on the research, and it would be something to regret for a long time.

Writing a thesis is tough work. One anonymous post doctoral researcher told me: "You should tell everyone that it's going to be unpleasant, that it will mess up their lives, that they will have to give up their friends and their social lives for a while. It's a tough period for almost every student." She's right: it is certainly hard work, it will be probably be stressful and you will have to adapt your rhythm to it. It is also an important rite of passage and the satisfaction you will feel afterwards is wonderful. On behalf of scholars everywhere, I wish you good luck!

A suggested thesis structure

The list of contents and chapter headings below is appropriate for some theses. In some cases, one or two of them may be irrelevant. Results and Discussion are usually combined in several chapters of a thesis. Think about the plan of chapters and decide what is best to report your work. Then make a list, in point form, of what will go in each chapter. Try to make this rather detailed, so that you end up with a list of points that corresponds to subsections or even to the paragraphs of your thesis. At this stage, think hard about the logic of the presentation: within chapters, it is often possible to present the ideas in different order, and not all arrangements will be equally easy to follow. If you make a plan of each chapter and section before you sit down to write, the result will probably be clearer and easier to read. It will also be easier to write.

Copyright waiver

Your institution may have a form for this (UNSW does). In any case, this standard page gives the university library the right to publish the work, possibly by microfilm or some other medium. (At UNSW, the Postgraduate Student Office will give you a thesis pack with various guide-lines and rules about thesis format. Make sure that you consult that for its formal requirements, as well as this rather informal guide.)

Declaration

Check the wording required by your institution, and whether there is a standard form. Many universities require something like: "I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person nor material which to a substantial extent has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgement has been made in the text. (signature/name/date)"

Title page

This may vary among institutions, but as an example: Title/author/"A thesis submitted for the degree of Doctor of Philosophy in the Faculty of Science/The University of New South Wales"/date.

Abstract

Of all your thesis, this part will be the most widely published and most read because it will be published in Dissertation Abstracts International. It is best written towards the end, but not at the very last minute because you will probably need several drafts. It should be a distillation of the thesis: a concise description of the problem(s) addressed, your method of solving it/them, your results and conclusions. An abstract must be self-contained. Usually they do not contain references. When a reference is necessary, its details should be included in the text of the abstract. Check the word limit.

Acknowledgements

Most thesis authors put in a page of thanks to those who have helped them in matters scientific, and also indirectly by providing such essentials as food, education, genes, money, help, advice, friendship etc. *If any of your work is collaborative, you should make it quite clear who did which sections.*

Table of contents

The introduction starts on page 1, the earlier pages should have roman numerals. It helps to have the subheadings of each chapter, as well as the chapter titles. Remember that the thesis may be used as a reference in the lab, so it helps to be able to find things easily.

Introduction

What is the topic and why is it important? State the problem(s) as simply as you can. Remember that you have been working on this project for a few years, so you will be very close to it. Try to step back mentally and take a broader view of the problem. How does it fit into the broader world of your discipline?

Especially in the introduction, do not overestimate the reader's familiarity with your topic. You are writing for researchers in the general area, but not all of them need be specialists in your particular topic. It may help to imagine such a person---think of some researcher whom you might have met at a conference for your subject, but who was working in a different area. S/he is intelligent, has the same general background, but knows little of the literature or tricks that apply to your particular topic.

The introduction should be interesting. If you bore the reader here, then you are unlikely to revive his/her interest in the materials and methods section. For the first paragraph or two, tradition permits prose that is less dry than the scientific norm. If want to wax lyrical about your topic, here is the place to do it. Try to make the reader want to read the kilogram of A4 that has arrived uninvited on his/her desk. Go to the library and read several thesis introductions. Did any make you want to read on? Which ones were boring?

This section might go through several drafts to make it read well and logically, while keeping it short. For this section, I think that it is a good idea to ask someone who is not a

specialist to read it and to comment. Is it an adequate introduction? Is it easy to follow? There is an argument for writing this section---or least making a major revision of it---towards the end of the thesis writing. Your introduction should tell where the thesis is going, and this may become clearer during the writing.

Literature review

Where did the problem come from? What is already known about this problem? What other methods have been tried to solve it?

Ideally, you will already have much of the hard work done, if you have been keeping up with the literature as you vowed to do three years ago, and if you have made notes about important papers over the years. If you have summarised those papers, then you have some good starting points for the review.

How many papers? How relevant do they have to be before you include them? Well, that is a matter of judgement. On the order of a hundred is reasonable, but it will depend on the field. You are the world expert on the (narrow) topic of your thesis: you must demonstrate this.

A political point: make sure that you do not omit relevant papers by researchers who are like to be your examiners, or by potential employers to whom you might be sending the thesis in the next year or two.

Middle chapters

In some theses, the middle chapters are the journal articles of which the student was major author. There are several disadvantages to this format.

One is that a thesis is both allowed and expected to have more detail than a journal article. For journal articles, one usually has to reduce the number of figures. In many cases, all of the interesting and relevant data can go in the thesis, and not just those which appeared in the journal. The degree of experimental detail is usually greater in a thesis. Relatively often a researcher requests a thesis in order to obtain more detail about how a study was performed.

Another disadvantage is that your journal articles may have some common material in the introduction and the "Materials and Methods" sections.

The exact structure in the middle chapters will vary among theses. In some theses, it is necessary to establish some theory, to describe the experimental techniques, then to report what was done on several different problems or different stages of the problem, and then finally to present a model or a new theory based on the new work. For such a thesis, the chapter headings might be: Theory, Materials and Methods, {first problem}, {second

problem}, {third problem}, {proposed theory/model} and then the conclusion chapter. For other theses, it might be appropriate to discuss different techniques in different chapters, rather than to have a single Materials and Methods chapter.

Here follow some comments on the elements Materials and Methods, Theory, Results and discussion which may or may not correspond to thesis chapters.

Materials and Methods

This varies enormously from thesis to thesis, and may be absent in theoretical theses. It should be possible for a competent researcher to reproduce exactly what you have done by following your description. There is a good chance that this test will be applied: sometime after you have left, another researcher will want to do a similar experiment either with your gear, or on a new set-up in a foreign country. Please write for the benefit of that researcher.

In some theses, particularly multi-disciplinary or developmental ones, there may be more than one such chapter. In this case, the different disciplines should be indicated in the chapter titles.

Theory

When you are reporting theoretical work that is not original, you will usually need to include sufficient material to allow the reader to understand the arguments used and their physical bases. Sometimes you will be able to present the theory *ab initio,* but you should not reproduce two pages of algebra that the reader could find in a standard text. Do not include theory that you are not going to relate to the work you have done.

When writing this section, concentrate at least as much on the physical arguments as on the equations. What do the equations mean? What are the important cases?

When you are reporting your own theoretical work, you must include rather more detail, but you should consider moving lengthy derivations to appendices. Think too about the order and style of presentation: the order in which you did the work may not be the clearest presentation.

Suspense is not necessary in reporting science: you should tell the reader where you are going before you start.

Results and discussion

The results and discussion are very often combined in theses. This is sensible because of the length of a thesis: you may have several chapters of results and, if you wait till they are all presented before you begin discussion, the reader may have difficulty remembering what you are talking about. The division of Results and Discussion material into chapters is usually best done according to subject matter.

Make sure that you have described the conditions which obtained for each set of results. What was held constant? What were the other relevant parameters? Make sure too that you have used appropriate statistical analyses. Where applicable, show measurement errors and standard errors on the graphs. Use appropriate statistical tests.

Take care plotting graphs. The origin and intercepts are often important so, unless the ranges of your data make it impractical, the zeros of one or both scales should usually appear on the graph. You should show error bars on the data, unless the errors are very small. For single measurements, the bars should be your best estimate of the experimental errors in each coordinate. For multiple measurements these should include the standard error in the data. The errors in different data are often different, so, where this is the case, regressions and fits should be weighted (i.e. they should minimize the sum of squares of the differences weighted inversely as the size of the errors.) (A common failing in many simple software packages that draw graphs and do regressions is that they do not treat errors adequately. UNSW student Mike Johnston has written a plotting routine that plots data with error bars and performs weighted least square regressions. It is at http://www.phys.unsw.edu.au/3rdyearlab/graphing/graph.html). You can just 'paste' your data into the input and it generates a .ps file of the graph.

In most cases, your results need discussion. What do they mean? How do they fit into the existing body of knowledge? Are they consistent with current theories? Do they give new insights? Do they suggest new theories or mechanisms?

Try to distance yourself from your usual perspective and look at your work. Do not just ask yourself what it means in terms of the orthodoxy of your own research group, but also how other people in the field might see it. Does it have any implications that do not relate to the questions that you set out to answer?

Final chapter, references and appendices

Conclusions and suggestions for further work

Your abstract should include your conclusions in very brief form, because it must also include some other material. A summary of conclusions is usually longer than the final section of the abstract, and you have the space to be more explicit and more careful with qualifications. You might find it helpful to put your conclusions in point form.

It is often the case with scientific investigations that more questions than answers are produced. Does your work suggest any interesting further avenues? Are there ways in which your work could be improved by future workers? What are the practical implications of your work?

This chapter should usually be reasonably short---a few pages perhaps. As with the

introduction, I think that it is a good idea to ask someone who is not a specialist to read this section and to comment.

References (See also under literature review)

It is tempting to omit the titles of the articles cited, and the university allows this, but think of all the times when you have seen a reference in a paper and gone to look it up only to find that it was not helpful after all.

Appendices

If there is material that should be in the thesis but which would break up the flow or bore the reader unbearably, include it as an appendix. Some things which are typically included in appendices are: important and original computer programs, data files that are too large to be represented simply in the results chapters, pictures or diagrams of results which are not important enough to keep in the main text.

Some sites with related material

How to survive a thesis defence
Research resources and linkssupplied by Deakin University
'Writing and presenting your thesis or dissertation'by Joseph Levine at Michigan State University, USA
Postgraduate Student Resourcessupplied by University of Canberra
A useful aid to surviving meetings with management
The National Association of Graduate - Professional Students(USA)

Some relevant texts

Stevens, K. and Asmar, C (1999) 'Doing postgraduate research in Australia'. Melbourne University Press, Melbourne ISBN 0 522 84880 X.
Phillips, E.M and Pugh, D.S. (1994) 'How to get a PhD : a handbook for students and their supervisors'. Open University Press, Buckingham, England
Tufte, E.R. (1983) 'The visual display of quantitative information'. Graphics Press, Cheshire, Conn.
Tufte, E.R. (1990) 'Envisioning information' Graphics Press, Cheshire, Conn.

Distribution

If you have found these documents useful, please feel free to pass the address or a hard copy to any other thesis writers or graduate student organisations. Please do not sell them, or use any of the contents without acknowledgement.

Suggestions, thanks and caveats

This document will be updated occasionally. If you have suggestions for inclusions, amendments

or other improvements, please send them. Do so after you have submitted the thesis---*do not use this invitation as a displacement activity.* I thank Marilyn Ball, Gary Bryant, Bill Whiten and J. Douglas, whose suggestions have been incorporated in this version. Substantial contributions will be acknowledged in future versions. I also take this opportunity to thank my own thesis advisers, Stjepan Marcelja and Jacob Israelachvili, for their help and friendship, and to thank the graduate students to whom I have had the pleasure to be an adviser, a colleague and a friend. Opinions expressed in these notes are mine and do not necessarily reflect the policy of the University of New South Wales or of the School of Physics.

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Joe's scientific home page
A list of educational links
Joe's music page

How to survive a thesis defence

some notes by
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This document is an appendix to

 How to write a thesis

- The thesis defence or viva is like an examination in some ways. It is different in many ways, however. The chief difference is that *the candidate usually knows more about the syllabus than do the examiners*.

- Some questions will be sincere questions: the asker asks because s/he doesn't know and expects that the candidate will be able to rectify this. Students often expect questions to be difficult and attacking, and answer them accordingly. Often the questions will be much simpler than you expect.

- In a curious relativistic effect, time expands in the mind of the student. A few seconds pause to reflect before answering seems eminently reasonable to the panel, but to the defender it seems like minutes of mute failure. *Take your time*.

- For the same reason, let them take their time. Let them finish the question.

- The phrase "That's a good question" is exceedingly useful. It flatters the asker and may get him/her onside, or less offside; it gives you time to think; it implies that you have understood the question and assessed it already and that you have probably thought about it before. If necessary, it can be followed by the stalwart "Now the answer to that is not obvious/straightforward..." which has the same advantages.

- If the nightmare ever did come true, and some questioner found a question that put something in the work in doubt... mind you this is thankfully very rare.... then what? Well the first thing would be to concede that the question imposes a serious limitation on the applicability of the work "Well you have identified a serious limitation in this technique, and the results have to be interpreted in the light of that observation". The questioner is then more likely to back off and even help answer it, whereas a straight denial may encourage him/her to pursue more ardently. Then go through the argument in detail - showing listeners how serious it is while giving yourself time to find flaws in

it or to limit the damage that will ensue. In the worst caese, one would then think of what can be saved. But all this is hypothetical because this won't happen.

- What usually happens is that the examiners have read the work perhaps twice, and looked closely at some parts that interested them most. These are usually the good bits. They are not out to fail you. *It is a lot more complicated to fail you than to pass you.* In general, they feel good about the idea of a new, fresh researcher coming into their area. You are no immediate threat to them. They have to show that they have read it and they have to give you the opportunity to show that you understand it (you do, of course). And they usually have a genuine interest in the work. Some of them may feel it is necessary to maintain their image as senior scholars and founts of wisdom. Judicious use of the "Good question", "Yes, you're right of course", "Good idea.." and "Thanks for that" will allow that with a minimum of fuss and a maximum of time for champagne drinking.

- If one of the examiners is a real ..., your thesis defence is probably not the best place and time in which to do anything about it, except perhaps for allowing him/her to demonstrate it clearly and thus to establish the support of the rest of the panel. If you want a major dispute, save it up for when you are on even ground, unless you are very very sure of yourself and think that you have nothing to lose.

- Be ready for a 'free kick'. It is relatively common that a panel will ask one (or more) questions that, whatever the actual wording may be, are essentially an invitation to you to tell them (briefly) what is important, new and good in your thesis. You ought not stumble at this stage, so you should rehearse this. You should be able to produce on demand (say) a one minute speech and a five minute speech, and be prepared to extend them if invited by further questions. Do not try to recite your abstract: written and spoken styles should be rather different. Rather, rehearse answers to the question: "What have you done that merits a PhD?".

- Read points i and ii again. Keep calm - and good luck!

Opinions expressed in these notes are mine and do not necessarily reflect the policy of the University of New South Wales or of the School of Physics.

 How to write a thesis

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 The University of New South Wales
 School of Physics

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Writing and Presenting Your Thesis or Dissertation

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We have a new address for the Thesis/Dissertation Guide!

http://www.LearnerAssociates.net/dissthes

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(Last Updated:)

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(Last Updated:)

Introduction

This guide has been created to assist my graduate students in thinking through the many aspects of crafting, implementing and defending a thesis or dissertation. It is my attempt to share some of the many ideas that have surfaced over the past few years that definitely make the task of finishing a graduate degree so much easier. (This Guide is a companion to the Guide for Writing a Funding Proposal.)

Usually a guide of this nature focuses on the actual implementation of the research. This is not the focus of this guide. Instead of examining such aspects as identifying appropriate sample size, field testing the instrument and selecting appropriate statistical tests, this guide looks at many of the quasi-political aspects of the process. Such topics as how to select a supportive committee, making a compelling presentation of your research outcomes and strategies for actually getting the paper written are discussed.

Of course, many of the ideas that are presented can be used successfully by other graduate students studying under the guidance of other advisers and from many different disciplines. *However, the use of this guide carries no guarantee - implied or otherwise.* When in doubt check with your adviser. Probably the best advice to start with is the idea of not trying to do your research entirely by yourself. Do it in conjunction with your adviser. Seek out his/her input and assistance. Stay in touch with your adviser so that both of you know what's happening. There's a much better chance of getting to the end of your project and with a smile on your face.

With this in mind, enjoy the guide. I hope it will help you finish your graduate degree in good shape. Good luck and good researching!

(NOTE: I have spent time reviewing a number of different books that are available to help in writing a thesis/dissertation. The quality of the books, as can be expected, varies greatly. Feel free to check out my ***listing of books and my reactions to them****.*

Summary of Key Ideas in this Guide

The Thinking About It Stage

- 1. Be inclusive with your thinking.
- 2. Write down your ideas.
- 3. Don't be overly influenced by others-it's your research.
- 4. Try and set a realistic goal.
- 5. Set appropriate time lines.
- 6. Take a leave of absence when it will do the most good.
- 7. Try a preliminary study to help clarify your research.

Preparing The Proposal

- 8. Read other proposals.
- 9. Prepare a comprehensive review of the literature.
- 10. Photocopy relevant articles.
- 11. Proposal should be first 3 chapters of dissertation.
- 12. Focus your research.
- 13. Include a title on your proposal.
- 14. Organize around a set of questions.
- 15. Some considerations for designing your research:
  - a. Design your research so the subjects benefit.
  - b. Choose your methodology wisely.
  - c. Consider combining methodologies.
  - d. Carefully select location for your research.
  - e. Avoid conducting research in conjunction with another agency.
- 16. Use your advisory committee well.
  - a. Select faculty who will support you.
  - b. Your major professor is your ally.
  - c. Provide committee with well written proposal.
  - d. Plan the proposal meeting well.

Writing The Thesis Or Dissertation

The Thesis/Dissertation Defense

THE "THINKING ABOUT IT" STAGE

The "thinking about it stage" is when you are finally faced with the reality of completing your degree. Usually the early phases of a graduate program proceed in clear and very structured ways. The beginning phases of a graduate program proceed in much the same manner as an undergraduate degree program. There are clear requirements and expectations, and the graduate student moves along, step by step, getting ever closer to the completion of the program. One day, however, the clear structure begins to diminish and now you're approaching the thesis/dissertation stage. This is a new and different time. These next steps are more and more defined by **you** and not your adviser, the program, or the department.

1. **Be inclusive with your thinking.**Don't try to eliminate ideas too quickly. Build on your ideas and see how many different research projects you can identify. Give yourself the luxury of being expansive in your thinking at this stage -- you won't be able to do this later on. Try and be creative.

2. **Write down your ideas.** This will allow you to revisit an idea later on. Or, you can modify and change an idea. If you don't write your ideas they tend to be in a continual state of change and you will probably have the feeling that you're not going anywhere. What a great feeling it is to be able to sit down and scan the many ideas you have been thinking about, if **they're written down.**

3. **Try not to be overly influenced at this time by what you feel others expect from you** (your colleagues, your profession, your academic department, etc.). You have a much better chance of selecting a topic that will be really of interest to you if it is your topic. This will be one of the few opportunities you may have in your professional life to focus in on a research topic that is really of your own choosing.

4. **Don't begin your thinking by assuming that your research will draw international attention to you!!** Instead, be realistic in setting your goal. Make sure your expectations are tempered by:

... the realization that you are fulfilling an academic requirement,

... the fact that the process of conducting the research may be just as important (or more important) than the outcomes of the research, and

... the idea that first and foremost the whole research project should be a learning experience for you.

If you can keep these ideas in mind while you're thinking through your research you stand an excellent chance of having your research project turn out well.

5. **Be realistic about the time that you're willing to commit to your research project.** If it's a 10 year project that you're thinking about admit it at the beginning and then decide whether or not you have 10 years to give to it. If the project you'd like to do is going to demand more time than you're willing to commit then you have a problem.

I know it's still early in your thinking but it's never too early to create a draft of a timeline. Try using the 6 Stages (see the next item) and put a start and a finish time for each. Post your timeline in a conspicuous place (above your computer monitor?) so that it continually reminds you how you're doing. Periodically update your timeline with new dates as needed. (*Thanks to a website visitor from Philadelphia for sharing this idea.*)

6. If you're going to ask for a leave of absence from your job while you're working on your research this isn't a good time to do it. Chances are you can do the "thinking about it" stage without a leave of absence. Assuming that there are six major phases that you will have during your research project,

probably **the best time to get the most from a leave of absence is during the fourth stage* - the writing stage.** This is the time when you really need to be thinking well. To be able to work at your writing in large blocks of time without interruptions is something really important. A leave of absence from your job can allow this to happen. A leave of absence from your job prior to this stage may not be a very efficient use of the valuable time away from your work.

Stage 1 - Thinking About It

Stage 2 - Preparing the Proposal

Stage 3- Conducting the Research

Stage 4- Writing the Research Paper*

Stage 5- Sharing the Research Outcomes with Others

Stage 6- Revising the Research Paper

7. It can be most helpful at this early stage to try a very **small preliminary research study** to test out some of your ideas to help you gain further confidence in what you'd like to do. The study can be as simple as conducting half a dozen informal interviews with no attempt to document what is said. The key is that it will give you a chance to get closer to your research and to test out whether or not you really are interested in the topic. And, you can do it before you have committed yourself to doing something you may not like. Take your time and try it first.

PREPARING THE PROPOSAL

Assuming you've done a good job of "thinking about" your research project, you're ready to actually prepare the proposal. A word of caution - those students who tend to have a problem in coming up with a viable proposal often are the ones that have tried to rush through the "thinking about it" part and move too quickly to trying to write the proposal. Here's a final check. Do each of these statements describe you? If they do you're ready to prepare your research proposal.

I am **familiar** with other research that has been conducted in areas related to my research project.
(___Yes, it's me)
(___No, not me)

I have a clear **understanding** of the steps that I will use in conducting my research.
(___Yes, it's me)

(___No, not me)

I feel that I have the **ability** to get through each of the steps necessary to complete my research project.

(___Yes, it's me)
(___No, not me)

I know that I am **motivated** and have the **drive** to get through all of the steps in the research project.

(___Yes, it's me)
(___No, not me)

Okay, you're ready to write your research proposal. Here are some ideas to help with the task:

8. **Read through someone else's research proposal.** Very often a real stumbling block is that we don't have an image in our mind of what the finished research proposal should look like. How has the other proposal been organized? What are the headings that have been used? Does the other proposal seem clear? Does it seem to suggest that the writer knows the subject area? Can I model my proposal after one of **the** ones that I've seen? If you can't readily find a proposal or two to look at, ask your adviser to see some. Chances are your adviser has a file drawer filled with them.

9. Make sure your proposal has a **comprehensive review of the literature** included. Now this idea, at first thought, may not seem to make sense. I have heard many students tell me that "This is only the proposal. I'll do a complete literature search for the dissertation. I don't want to waste the time now." But, this is the time to do it. The rationale behind the literature review consists of an argument with two lines of analysis: 1) this research is needed, and 2) the methodology I have chosen is most appropriate for the question that is being asked. Now, why would you want to wait? Now is the time to get informed and to learn from others who have preceded you! If you wait until you are writing the dissertation it is too late. You've got to do it some time so you might as well get on with it and do it now. Plus, you will probably want to add to the literature review when you're writing the final dissertation. (*Thanks to a website visitor from Mobile, Alabama who helped to clarify this point.*)

10. With the ready availability of photocopy machines you should be able to bypass many of the hardships that previous dissertation researchers had to deal with in developing their literature review. When you read something that is important to your study, **photocopy the relevant article or section.** Keep your photocopies organized according to categories and sections. And, most importantly, photocopy the bibliographic citation so that you can easily reference the material in your bibliography. Then, when you decide to sit down and actually write the literature review, bring out your photocopied sections, put them into logical and sequential order, and then begin your writing.

11. What is a proposal anyway? **A good proposal should consist of the first three chapters of the dissertation.** It should begin with a statement of the problem/background information (typically Chapter I of the dissertation), then move on to a review of the literature (Chapter 2), and conclude with a

defining of the research methodology (Chapter 3). Of course, it should be written in a future tense since it is a proposal. To turn a good proposal into the first three chapters of the dissertation consists of changing the tense from future tense to past tense (from "This is what I would like to do" to "This is what I did") and making any changes based on the way you actually carried out the research when compared to how you proposed to do it. Often the intentions we state in our proposal turn out different in reality and we then have to make appropriate editorial changes to move it from proposal to dissertation.

12. **Focus your research very specifically.** Don't try to have your research cover too broad an area. Now you may think that this will distort what you want to do. This may be the case, but you will be able to do the project if it is narrowly defined. Usually a broadly defined project is not do-able. By defining too broadly it may sound better to you, but there is a great chance that it will be unmanageable as a research project. When you complete your research project it is important that you have something specific and definitive to say. This can be accommodated and enhanced by narrowly defining your project. Otherwise you may have only broadly based things to say about large areas that really provide little guidance to others that may follow you. Often the researcher finds that what he/she originally thought to be a good research project turns out to really be a *group* of research projects. Do one project for your dissertation and save the other projects for later in your career. Don't try to solve all of the problems in this one research project.

13. **Include a title on your proposal.** I'm amazed at how often the title is left for the end of the student's writing and then somehow forgotten when the proposal is prepared for the committee. A good proposal has a good title and it is the first thing to help the reader begin to understand the nature of your work. Use it wisely! Work on your title early in the process and revisit it often. It's easy for a reader to identify those proposals where the title has been focused upon by the student. Preparing a good title means:

...having the most important words appear toward the beginning of your title,

...limiting the use of ambiguous or confusing words,

..breaking your title up into a title and subtitle when you have too many words, and

...including key words that will help researchers in the future find your work.

14. It's important that your **research proposal be organized around a set of questions** that will guide your research. When selecting these guiding questions try to write them so that they frame your research and put it into perspective with other research. These questions must serve to establish the link between your research and other research that has preceded you. Your research questions should clearly show the relationship of your research to your field of study. Don't be carried away at this point and make your questions too narrow. You must start with broad relational questions.

A good question:

Do adult learners in a rural adult education setting have characteristics that are similar to adult learners in general ?

A poor question:

What are the characteristics of rural adult learners in an adult education program? (too narrow)

A poor question:

How can the XYZ Agency better serve rural adult learners? (not generalizable)

15. Now here are a few more ideas regarding the defining of your research project through your proposal.

a. Make sure that you will be **benefitting those who are participating in the research.** Don't only see the subjects as sources of data for you to analyze. Make sure you treat them as participants in the research. They have the right to understand what you are doing and you have a responsibility to share the findings with them for their reaction. Your research should not only empower you with new understandings but it should also empower those who are participating with you.

b. **Choose your methodology wisely.** Don't be too quick in running away from using a quantitative methodology because you fear the use of statistics. A qualitative approach to research can yield new and exciting understandings, but it should not be undertaken because of a fear of quantitative research. A well designed quantitative research study can often be accomplished in very clear and direct ways. A similar study of a qualitative nature usually requires considerably more time and a tremendous burden to create new paths for analysis where previously no path had existed. Choose your methodology wisely!

c. Sometimes a **combined methodology** makes the most sense. You can combine a qualitative preliminary study (to define your population more clearly, to develop your instrumentation more specifically or to establish hypotheses for investigation) with a quantitative main study to yield a research project that works well.

d. Deciding on **where you will conduct the research** is a major decision. If you are from another area of the country or a different country there is often an expectation that you will return to your "home" to conduct the research. This may yield more meaningful results, but it will also most likely create a situation whereby you are expected to fulfill other obligations while you are home. For many students the opportunity to conduct a research project away from home is an important one since they are able to better control many of the intervening variables that they can not control at home. Think carefully regarding your own situation before you make your decision.

e. What if you have the opportunity for **conducting your research in conjunction with another agency or project** that is working in related areas. Should you do it? Sometimes this works well, but most often the dissertation researcher gives up valuable freedom to conduct the research project in conjunction with something else. **Make sure the trade-offs are in your favor.** It can be very disastrous to have the other project suddenly get off schedule and to find your own research project temporarily delayed. Or, you had tripled the size of your sample since the agency was willing to pay the cost of postage. They paid for the postage for the pre-questionnaire. Now they are unable to assist with postage for the post-questionnaire. What happens to your research? I usually find that the cost of conducting dissertation research is not prohibitive and the trade-offs to work in conjunction with another agency are not in favor of the researcher. Think twice before altering your project to accommodate someone else. Enjoy the power and the freedom to make your own decisions (and mistakes!) -- this is the way we learn!

16. Selecting and preparing your advisory committee to respond to your proposal should not be taken lightly. If you do your "homework" well **your advisory committee can be most helpful to you.** Try these ideas:

a. If you are given the opportunity to select your dissertation committee do it wisely. Don't only focus on content experts. **Make sure you have selected faculty for your committee who are supportive of you** and are willing to assist you in successfully completing your research. You want a committee that you can ask for help and know that they will provide it for you. Don't forget, you can always access content experts who are not on your committee at any time during your research project.

b. **Your major professor/adviser/chairperson is your ally.** When you go to the committee for reactions to your proposal make sure your major professor is fully supportive of you. Spend time with him/her before the meeting so that your plans are clear and you know you have full support. The proposal meeting should be seen as an opportunity for you and your major professor to seek the advice of the committee. Don't ever go into the proposal meeting with the feeling that it is you against them!

c. **Provide the committee members with a well-written proposal** well in advance of the meeting. Make sure they have ample time to read the proposal.

d. **Plan the proposal meeting well.** If graphic presentations are necessary to help the committee with understandings make sure you prepare them so they look good. A well planned meeting will help your committee understand that you are prepared to move forward with well planned research. Your presentation style at the meeting should not belittle your committee members (make it sound like you know they have read your proposal) but you should not assume too much (go through each of the details with an assumption that maybe one of the members skipped over that section).

WRITING THE THESIS OR DISSERTATION

Now this is the part we've been waiting for. I must assume that you have come up with a good idea for research, had your proposal approved, collected the data, conducted your analyses and now you're about to start writing the dissertation. If you've done the first steps well this part shouldn't be too bad. In fact it might even be enjoyable!

(NOTE: Periodically I receive requests for information on how to prepare a "thesis statement" rather than actually writing a thesis/dissertation. How To Write a Thesis Statement is an excellent website that clearly sets forth what a "thesis statement" is and how to actually prepare one.)

17. The major myth in writing a dissertation is that you start writing at Chapter One and then finish your writing at Chapter Five. This is seldom the case. The most productive approach in writing the dissertation is to **begin writing those parts of the dissertation that you are most comfortable with.** Then move about in your writing by completing various sections as you think of them. At some point you will be able to spread out in front of you all of the sections that you have written. You will be able to sequence them in the best order and then see what is missing and should be added to the dissertation. This way seems to make sense and builds on those aspects of your study that are of most interest to you at any particular time. Go with what interests you, start your writing there, and then keep building!

(David Kraenzel - North Dakota State University - wrote in describing the "A to Z Method". Look at the first section of your paper. When you are ready go ahead and write it. If you are not ready, move section-by-section through your paper until you find a section where you have some input to make. Make your input and continue moving through the entire paper - from A to Z - writing and adding to those sections for which you have some input. Each time you work on your paper follow the same A to Z process. This will help you visualize the end product of your efforts from very early in your writing and each time you work on your paper you will be building the entire paper - from A to Z. *Thanks David!*)

18. If you prepared a comprehensive proposal you will now be rewarded! Pull out the proposal and begin by checking your proposed research methodology. Change the tense from future tense to past tense and then make any additions or changes so that the methodology section truly reflects what you did. You have now been able to **change sections from the proposal to sections for the dissertation.** Move on to the Statement of the Problem and the Literature Review in the same manner.

19. I must assume you're using some form of word processing on a computer to write your dissertation. (if you aren't, you've missed a major part of your doctoral preparation!) If your study has specific names of people, institutions and places that must be changed to provide anonymity don't do it too soon. Go ahead and **write your dissertation using the real names.** Then at the end of the writing stage you can easily have the computer make all of the appropriate name substitutions. If you make these substitutions too early it can really confuse your writing.

20. As you get involved in the actual writing of your dissertation you will find that conservation of paper will begin to fade away as a concern. Just as soon as you print a draft of a chapter there will appear a variety of needed changes and before you know it another draft will be printed. And, it seems

almost impossible to throw away any of the drafts! After awhile it will become extremely difficult to remember which draft of your chapter you may be looking at. **Print each draft of your dissertation on a different color paper**. With the different colors of paper it will be easy to see which is the latest draft and you can quickly see which draft a committee member might be reading. (*Thanks to Michelle O'Malley at University of Florida for sharing this idea.*)

✔ 21. The one area where I would caution you about using a word processor is in the creation of elaborate graphs or tables. I've seen too many students spend too many hours in trying to use their word processor to create a graph that could have been done by hand in 15 minutes. So, the simple rule is to **use hand drawing for elaborate tables and graphs for the draft of your dissertation.** Make sure your committee can clearly understand your graph, but don't waste the time trying to make it perfect. After you defend your dissertation is the time to prepare the "perfect" looking graphs and tables.

✔ 22. Dissertation-style writing is not designed to be entertaining. **Dissertation writing should be clear and unambiguous.** To do this well you should prepare a list of key words that are important to your research and then your writing should use this set of key words throughout. There is nothing so frustrating to a reader as a manuscript that keeps using alternate words to mean the same thing. If you've decided that a key phrase for your research is "educational workshop", then **do not** try substituting other phrases like "in-service program", "learning workshop", "educational institute", or "educational program." Always stay with the same phrase - "educational workshop." It will be very clear to the reader exactly what you are referring to.

✔ 23. **Review two or three well organized and presented dissertations.** Examine their use of headings, overall style, typeface and organization. Use them as a model for the preparation of your own dissertation. In this way you will have an idea at the beginning of your writing what your finished dissertation will look like. A most helpful perspective!

✔ 24. A simple rule - if you are presenting information in the form of a table or graph **make sure you introduce the table or graph in your text.** And then, following the insertion of the table/graph, make sure you discuss it. If there is nothing to discuss then you may want to question even inserting it.

✔ 25. Another simple rule - **if you have a whole series of very similar tables try to use similar words in describing each.** Don't try and be creative and entertaining with your writing. If each introduction and discussion of the similar tables uses very similar wording then the reader can easily spot the differences in each table.

✔ 26. We are all familiar with how helpful the Table of Contents is to the reader. What we sometimes don't realize is that it is also invaluable to the writer. **Use the Table of Contents to help you improve your manuscript.** Use it to see if you've left something out, if you are presenting your sections in the most logical order, or if you need to make your wording a bit more clear. Thanks to the miracle of computer technology, you can easily copy/paste each of your headings from throughout your writing into the Table of Contents. Then sit back and see if the Table of Contents is clear and will make good sense to the reader. You will be amazed at how easy it will be to see areas that may need some more attention.

Don't wait until the end to do your Table of Contents. Do it early enough so you can benefit from the information it will provide to you.

27. If you are including a Conclusions/Implications section in your dissertation **make sure you really present conclusions and implications.** Often the writer uses the conclusions/implications section to merely restate the research findings. Don't waste my time. I've already read the findings and now, at the Conclusion/Implication section, I want you to help me understand what it all means. This is a key section of the dissertation and is sometimes best done after you've had a few days to step away from your research and allow yourself to put your research into perspective. If you do this you will no doubt be able to draw a variety of insights that help link your research to other areas. I usually think of conclusions/implications as the "So what" statements. In other words, what are the key ideas that we can draw from your study to apply to my areas of concern.

28. Potentially the silliest part of the dissertation is the Suggestions for Further Research section. This section is usually written at the very end of your writing project and little energy is left to make it very meaningful. The biggest problem with this section is that the suggestions are often ones that could have been made prior to you conducting your research. **Read and reread this section until you are sure that you have made suggestions that emanate from your experiences** in conducting the research and the findings that you have evolved. Make sure that your suggestions for further research serve to link your project with other projects in the future and provide a further opportunity for the reader to better understand what you have done.

29. Now it's time to write the last chapter. But what chapter is the last one? My perception is that **the last chapter should be the first chapter.** I don't really mean this in the literal sense. Certainly you wrote Chapter One at the beginning of this whole process. Now, at the end, it's time to "rewrite" Chapter One. After you've had a chance to write your dissertation all the way to the end, the last thing you should do is turn back to Chapter One. Reread Chapter One carefully with the insight you now have from having completed Chapter Five. Does Chapter One clearly help the reader move in the direction of Chapter Five? Are important concepts that will be necessary for understanding Chapter Five presented in Chapter One?

THE THESIS/DISSERTATION DEFENSE

What a terrible name - a ***dissertation defense***. It seems to suggest some sort of war that you're trying to win. And, of course, with four or five of them and only one of you it sounds like they may have won the war before the first battle is held. I wish they had called it a dissertation seminar or professional symposium. I think the name would have brought forward a much better picture of what should be expected at this meeting.

Regardless of what the meeting is called, try to remember that the purpose of the meeting is for you to show everyone how well you have done in the conducting of your research study and the preparation of your dissertation. In addition there should be a seminar atmosphere where the exchange of ideas is valued.

You are clearly the most knowledgeable person at this meeting when it comes to your subject. And, the members of your committee are there to hear from you and to help you better understand the very research that you have invested so much of yourself in for the past weeks. Their purpose is to help you finish your degree requirements. Of course other agenda often creep in. If that happens, try to stay on course and redirect the meeting to your agenda.

The following ideas should help you keep the meeting on your agenda.

30. The most obvious suggestion is the one seldom followed. Try to **attend one or more defenses prior to yours.** Find out which other students are defending their research and sit in on their defense. In many departments this is expected of all graduate students. If this is not the case for you**,** check with your adviser to see that you can get an invitation to attend some defenses.

At the defense try and keep your focus on the interactions that occur. Does the student seem relaxed? What strategies does the student use to keep relaxed? How does the student interact with the faculty? Does the student seem to be able to answer questions well? What would make the situation appear better? What things should you avoid? You can learn a lot from sitting in on such a meeting.

31. Find opportunities to **discuss your research with your friends and colleagues.** Listen carefully to their questions. See if you are able to present your research in a clear and coherent manner. Are there aspects of your research that are particularly confusing and need further explanation? Are there things that you forgot to say? Could you change the order of the information presented and have it become more understandable?

32. I hope you **don't try circulating chapters of your dissertation to your committee members as you are writing them.** I find this practice to be most annoying and one that creates considerable problems for the student. You must work closely with your dissertation director. He/she is the person you want to please. Develop a strategy with the dissertation director regarding how and when your writing should be shared. Only after your dissertation director approves of what you have done should you attempt to share it with the rest of the committee. And by then it's time for the defense. If you prematurely share sections of your writing with committee members you will probably find yourself in a situation where one committee member tells you to do one thing and another member says to do something else. What should you do? The best answer is not to get yourself into such a predicament. The committee meeting (the defense) allows the concerns of committee members to surface in a dialogical atmosphere where opposing views can be discussed and resolved.

33. It's important that you have the feeling when entering your defense that you **aren't doing it alone.** As was mentioned earlier, your major professor should be seen as an ally to you and "in your corner" at the defense. Don't forget, if you embarrass yourself at the defense you will also be embarrassing your dissertation director. So, give both of you a chance to guarantee there is no embarrassment. Meet together ahead of time and discuss the strategy you should use at the defense. Identify any possible problems that may occur and discuss ways that they should be dealt with. **Try and make the defense more of a team effort.**

34. **Don't be defensive at your defense** (this sounds confusing!). This is easy to say but sometimes hard to fulfill. You've just spent a considerable amount of time on your research and there is a strong tendency for YOU to want to defend everything you've done. However, the committee members bring a new perspective and may have some very good thoughts to share. Probably the easiest way to deal with new input is to say something like "Thank you so much for your idea. I will be giving it a lot of consideration." There, you've managed to diffuse a potentially explosive situation and not backed yourself or the committee member into a corner. Plus, you've not promised anything. Try and be politically astute at this time. Don't forget that your ultimate goal is to successfully complete your degree.

35. Probably the most disorganized defense I've attended is the one where the dissertation director began the meeting by saying, "You've all read the dissertation. What questions do you have for the student?" What a mess. Questions started to be asked that bounced the student around from one part of the dissertation to another. There was no semblance of order and the meeting almost lost control due to its lack of organization. At that time I vowed to protect my students from falling into such a trap by helping them **organize the defense as an educational presentation.**

Here's what we do:

> I ask the student to prepare a 20-25 minute presentation that reviews the entire study. This is done through the help of a series of 10-12 large pieces of paper, wall charts, that have been posted sequentially around the walls of the room. Each piece of paper contains key words regarding each of the different aspects of the study. Some pieces of paper contain information about the study setting, questions and methodology. Other pieces of paper present findings and finally there are those pieces that present the conclusions and implications. By preparing these wall charts ahead of time the student is able to relax during the presentation and use the pieces of paper as if they were a road map toward the goal. No matter how nervous you are you can always let the wall charts guide **YOU** through your presentation. Lettering is done with a dark marking pen and extra notes are included in very small printing with a pencil (that no one can really see). We've also tried it with overhead projected transparencies but it doesn't work as well. With the transparencies they're gone from view after a few seconds. The wall charts stay up for everyone to see and to help focus attention.

Following this structured presentation the committee begins to ask questions, but as can be expected the questions follow along with the wall charts and the whole discussion proceeds in an orderly manner. If guests are present at the defense, this form of presentation helps them also follow along and understand exactly what was accomplished through the research.

36. Consider **tape recording your defense.** Using a small portable recorder, record your entire presentation and also the questions and comments of the committee members. This helps in two ways. First, the student has documentation to assist in making suggested changes and corrections in the dissertation. The student can relax more and listen to what is being said by the committee members. The tape recorder is taking notes! Second, the student has a permanent record of his/her presentation of the

study. By keeping the paper charts and the tape together, they can be most useful for reviewing the research in future years when a request is made for a presentation. (Bring out the tape and the pieces of paper the night before your presentation and you can listen to *you* make the presentation. What a good way to review.)

Well that about does it. By following the above suggestions and ideas I hope it will be possible for you to finish your graduate degree program in a most timely and enjoyable manner. By looking ahead to the different aspects of this final part of your graduate study it becomes clear that you can do a number of things to insure your success. Good luck!

37. Oh, I almost forgot. There's one last thing. Get busy and **prepare an article or paper that shares the outcomes of your research.** There will be no better time to do this than now. Directly after your defense is when you know your study the best and you will be in the best position to put your thinking on paper. If you put this writing task off it will probably never get done. Capitalize on all of the investment you have made in your research and reap some additional benefit - start writing.

Click to Download Printable (.pdf) Version

Thinking About Buying a Book?

I have spent time identifying a number of different books that are available to help in writing a thesis/dissertation. The quality of the books, as can be expected, varies greatly. If you would like to see a **listing of the books I have identified and my reactions to them**, please click here.

A Handful of Worthwhile Bookmarks -

If I only had time to visit a single website for help with my thesis I'd probably go directly to the **Thesis Handbook** **(http://www.tele.sunyit.edu/ThesisHandbook.html)** maintained by the Telecommunications Program at SUNY Institute of Technology. Especially helpful are the accompanying Thesis Workbook and Frequently Asked Questions where you will find a wealth of clearly written and helpful information. (Selecting a topic; Developing a search strategy for going after relevant literature: Deciding which tense to use in your writing; etc.)

An extensive set of hints and ideas on how to improve your dissertation/thesis writing. **How To Write A Dissertation or Bedtime Reading For People Who Do Not Have Time To Sleep**

(http://www.cs.purdue.edu/homes/dec/essay.dissertation.html) lays out suggestion after suggestion in direct and non-confusing form. A great list to bring out after you've completed the first draft of your writing, are rather tired of your topic, and you are not sure where to begin your fine tuning.


An excellent website with lots of highly specific information (especially if the focus of your work is in a scientific or technical area) has been developed by Joe Wolfe at The University of New South Wales (Australia). **How to Write a PhD Thesis** **(http://www.phys.unsw.edu.au/~jw/thesis.html)** provides a variety of very useful suggestions on how to get from the beginning to the end of your thesis project - and survive the process!


Wouldn't it be great if there were a bunch of theses/dissertations available for reading right on the web? Well, there are some resources you should be aware of that will let you see what the finished product could look like. First, there is an **Experimental Digital Library of M.I.T. Theses** **(http://theses.mit.edu/)** which includes electronically-submitted theses. Next, you can always purchase a copy of most US dissertations/theses. These are available from UMI's website - **UMI's Online Dissertation Services** **(http://www.umi.com/hp/Products/Dissertations.html)**. The University of Wisconsin has a site which lists **Sites with Full Text Access to Dissertations** **(http://www.library.wisc.edu/libraries/Memorial/elecdiss.htm#fulltext)**. You should also be aware of the various Electronic Dissertation/Thesis (ETD) projects that are currently underway. A good access to this area is via the library at the University of Virginia which has a page dealing with **Electronic Theses and Dissertations in the Humanities** **(http://etext.virginia.edu/ETD/)**.


Another website that's worth visiting is maintained by Computer Science & Electrical Engineering at the University of Maryland Baltimore County and also the Computer Science Department at Indiana University-Bloomington. **How to Be a Good Graduate Student/Advisor** **(http://www.cs.indiana.edu/how.2b/how.2b.html)** "attempts to raise some issues that are important for graduate students to be successful and to get as much out of the process as possible, and for advisors who wish to help their students be successful."


Prof. John W. Chinneck at Carleton University (Ottawa, Canada) has created a very practical and well written webpage on the preparation of your thesis. **How to Organize your Thesis** **(http://www.sce.carleton.ca/faculty/chinneck/thesis.html)** starts with a description of what graduate research/the graduate thesis is all about and then moves point-by-point through a "generic thesis skeleton".


If you are in need of some gentle prodding and a bit of humor to go along with it, check out the **Dead Thesis Society** **(http://is2.dal.ca/~dts/)** - a support group for graduate students. Lots of well organized information that is moderated by Frank Elgar, a graduate student in Psychology at Dalhousie University in Halifax, Nova Scotia.


Not sure of all the administrative steps at your university that are required to successfully complete a dissertation? Check out this well thought through PowerPoint presentation from **Pepperdine University's Dissertation Support Web Site** **(http://moon.pepperdine.edu/gsep/as/dissertation/dissertation-process/index.htm)**. Everything seems

to be included from a definition of exactly what is a dissertation all the way to when you can start using the title of "Doctor."

- Feeling a bit lonesome in the process of writing your thesis or dissertation? Take a minute to find out who else has visited this website and read **what others have said about this Guide (http://www.anrecs.msu.edu/dissthes/results.htm)** and their own situation. It might just be reassuring!!

- And finally, when all else fails, you might want to see what other sites have included, on their website, a **link to this Thesis/Dissertation website**. These other sites often have a variety of additional resources to check out.

Your comments and suggestions for improving and extending this guide would be most welcome. Please click on the box (below) to send feedback about this website. Thank you!

Joe Levine

Dissertation/Thesis Guide Feedback

Website Awards

Want to recommend this website to a friend? Use this handy form.

Your friends name.

Your friends email address.

Your Name

Your Email Address

Send It

Postgraduate Student Resources

General Advice to Postgrads and Supervisors

- How to Succeed in Postgraduate Study: A Guide for Students and Supervisors

A comprehensive guide written by Marie desJardins which makes good reading for anyone contemplating postgraduate study or postgraduate supervision. Adapted to an Australian context.

- Gateway on Research Supervision

This gateway is a worldwide reference source on the practice of research degree supervision. It links to websites offering information, advice and support useful for new supervisors, experienced supervisors, policy makers and training personnel in all fields of study.

Effective Writing

- Elements of Style by William Strunk

An excellent and well established guide to writing style, including grammar and punctuation. Immensely useful for those whose writing style has deteriorated through years of reading the scientific literature.

- Notes on Writing Papers and Theses

A guide to writing scientific papers and theses by Ken Lertzman. It is very comprehensive and includes both elements of good writing style and structure of scientific reports.

- Notes on Structuring a Scientific Paper

A more detailed text on writing a scientific paper, with a strong emphasis on structure -- what does and does not go into introductions, discussions etc.

- Guide to Thesis Format

A detailed guide to formatting a thesis, specifically for students in Applied Ecology at the University of Canberra. It is designed, among other things, to constrain students in honours, masters and PhD from competing on matters of appearance rather than substance.

- Research Theses -- An Examiner's Perpective

Text of a talk given to the University of Canberra Postgraduate on what examiners look for

when marking a thesis.

- Internet Technical Writing Course Guide

Analysis

- Introductory Statistics for Ecologists

An introduction to descriptive statistics, two-sample comparisons and analysis of variance using SAS for Windows. Self-evaluation is web-based.

Grantsmanship

- Notes on Applying for a Grant

A blow by blow description on how to maximize the probability of success in applying for grants.

- On the Art of Writing Proposals

Advice prepared by Adam Przeworski of New York University and Frank Salomon of the University of Wisconsin.

- Winning Research Grants

Advice prepared by Sylvia S. Bienvenu and Becky Patterson, University of Wisconsin.

Seminars and Conference Presentations

- Notes on Presenting a 12 minute Talk

Advice for preparing a short talk at a professional conference, where time is strictly limited.

Ethical Issues

- Guidelines for Responsible Practice in Research

The University of Canberra's Policies on Scientific Ethics, modified from those provided by the NH&MRC and the AVCC.

- Guidelines on Ethics and the Conduct of Research in Protected and other Environmentally Sensitive Areas

Produced by the Australian Science, Technology and Engineering Council (ASTEC).

- Uniform Requirements for Manuscripts Submitted to Journals

Produced by the International Committee of Medical Journal editors, but of wider utility.

- Guidelines for Use of Reptiles and Amphibians in Research

An ethical guide produced jointly by ASIH, the Herpetologists League and SSAR.

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Bullshit bingo

Do you keep falling asleep in meetings and seminars? What about those long and boring conference calls? Here is a way to change all that!

How to play: Check off each block when you hear these words during a meeting, seminar or phone call. When you get five blocks horizontally, vertically or diagonally, stand up and shout **Bullshit!**

synergy	strategic fit	gap analysis	best practice	bottom line
revisit	bandwidth	hardball	out of the loop	benchmark
value-added	proactive	win-win	think outside the box	fast track
result-driven	empower	knowledge base	total quality	touch base
mindset	client focus	ball park	game plan	leverage

Testimonials from satisfied players:

"I had only been in the meeting for five minutes when I won." -Jack W., Boston

"My attention span at meetings has improved dramatically." David D., Florida

"What a gas. Meetings will neverbe the same for me after my first win." Bill R. New York City

"The atmosphere was tense in the process meeting as fourteen of us waited for the fifth box." Ben G, Denver.

"The speaker was stunned as eight of us shouted 'bullshit' for the third time in two hours." Kathleen L., Atlanta

Writing and Presenting Your Thesis or Dissertation[1]

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Introduction

This guide has been created to assist my graduate students in thinking through the many aspects of crafting, implementing and defending a thesis or dissertation in areas related to the discipline of adult learning. It has been my purpose to share with my students some of the many ideas that have surfaced over the past few years that definitely make the task of finishing a graduate degree so much easier. (Note: This **Dissertation/Thesis Guide** is a companion to the **Guide for Writing a Funding Proposal** which can also be found on the worldwide web at: http://www.LearnerAssociates.net)

Usually a guide of this nature focuses on the actual implementation of the research. This is not the intention of this guide. Instead of examining such aspects as identifying appropriate sample size, field testing the instrument and selecting appropriate statistical tests, this guide looks at many of the quasi-political aspects of the process. Such topics as how to select a supportive committee, making a compelling presentation of your research outcomes and strategies for actually getting the paper written are discussed.

Of course, many of the ideas that are presented can be used successfully by other graduate students studying under the guidance of other advisers and from many different disciplines. *However, the use of this guide carries no guarantee - implied or otherwise*. When in doubt check with your adviser. Probably the best advice to start with is the idea of not trying to do your

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[1] This **Dissertation/Thesis Guide** has been created to assist graduate students in the successful completion of their graduate degree. With this in mind, permission is granted for non-commercial reproduction of the **Guide** for educational use as long as the **Guide** is made available in its entirety, full credit is given to the source and the author, and any fee associated with the dissemination of the **Guide** is limited to recovering duplication costs with no intention of making a profit from its sale.

research entirely by yourself. Do it in conjunction with your adviser. Seek out his/her input and assistance. Stay in touch with your adviser so that both of you know what's happening. There's a much better chance of getting to the end of your project and with a smile on your face.

With this in mind, enjoy the guide. I hope it will help you finish your graduate degree in good shape. Good luck and good researching!

The "Thinking About It" Stage

The "thinking about it stage" is when you are finally faced with the reality of completing your degree. Usually the early phases of a graduate program proceed in clear and very structured ways. The beginning phases of a graduate program proceed in much the same manner as an undergraduate degree program. There are clear requirements and expectations, and the graduate student moves along, step by step, getting ever closer to the completion of the program. One day, however, the clear structure begins to diminish and now you're approaching the thesis/dissertation stage. This is a new and different time. These next steps are more and more defined by you and not your adviser, the program, or the department.

✔1. **Be inclusive with your thinking.** Don't try to eliminate ideas too quickly. Build on your ideas and see how many different research projects you can identify. Give yourself the luxury of being expansive in your thinking at this stage -- you won't be able to do this later on. Try and be creative.

✔2. **Write down your ideas.** This will allow you to revisit an idea later on. Or, you can modify and change an idea. If you don't write your ideas they tend to be in a continual state of change and you will probably have the feeling that you're not going anywhere. What a great feeling it is to be able to sit down and scan the many ideas you have been thinking about, if they're written down.

✔3. **Try not to be overly influenced at this time by what you feel others expect from you** (your colleagues, your profession, your academic department, etc.). You have a much better chance of selecting a topic that will be really of interest to you if it is your topic. This will be one of the few opportunities you may have in your professional life to focus in on a research topic that is really of your own choosing.

✔4. **Don't begin your thinking by assuming that your research will draw international attention to you!!** Instead, be realistic in setting your goal. Make sure your expectations are tempered by:

... the realization that you are fulfilling an academic requirement,

... the fact that the process of conducting the research may be just as important (or more important) than the outcomes of the research, and

> ... the idea that first and foremost the whole research project should be a learning experience for you.

If you can keep these ideas in mind while you're thinking through your research you stand an excellent chance of having your research project turn out well.

✔5. **Be realistic about the time that you are willing to commit to your research project.** If it's a 10 year project that you're thinking about admit it at the beginning and then decide whether or not you have 10 years to give to it. If the project you'd like to do is going to demand more time than you're willing to commit then you have a problem.

I know it's still early in your thinking but it's never too early to create a draft of a timeline. Try using the 6 Stages (see the next item) and put a start and a finish time for each. Post your timeline in a conspicuous place (above your computer monitor?) so that it continually reminds you how you're doing. Periodically update your timeline with new dates as needed. (Thanks to a website visitor from Philadelphia for sharing this idea.)

✔6. If you're going to ask for a leave of absence from your job while you're working on your research this isn't a good time to do it. Chances are you can do the "thinking about it" stage without a leave of absence. Assuming that there are six major phases that you will have during your research project, **probably the best time to get the most from a leave of absence is during the fourth stage* - the writing stage.** This is the time when you really need to be thinking well. To be able to work at your writing in large blocks of time without interruptions is something really important. A leave of absence from your job can allow this to happen. A leave of absence from your job prior to this stage may not be a very efficient use of the valuable time away from your work.

Stage 1 - Thinking About It

Stage 2 - Preparing the Proposal

Stage 3- Conducting the Research

Stage 4- Writing the Research Paper*

Stage 5- Sharing the Research Outcomes with Others

Stage 6- Revising the Research Paper

✔7. It can be most helpful at this early stage to try a very **small preliminary research study** to test out some of your ideas to help you gain further confidence in what you'd like to do. The study can be as simple as conducting half a dozen informal interviews with no attempt to document what is said. The key is that it will give you a chance to get closer to your research and to test out whether or not you really are interested in the topic. And,

you can do it before you have committed yourself to doing something you may not like. Take your time and try it first.

Preparing the Proposal

Assuming you've done a good job of "thinking about" your research project, you're ready to actually prepare the proposal. A word of caution - those students who tend to have a problem in coming up with a viable proposal often are the ones that have tried to rush through the "thinking about it" part and move too quickly to trying to write the proposal. Here's a final check. Do each of these statements describe you? If they do you're ready to prepare your research proposal.

I am **familiar with other research** that has been conducted in areas related to my research project.

(___Yes, it's me)
(___No, not me)

I have a clear **understanding of the steps** that I will use in conducting my research.

(___Yes, it's me)
(___No, not me)

I feel that I have the **ability to get through each of the steps** necessary to complete my research project.

(___Yes, it's me)
(___No, not me)

I know that I am **motivated and have the drive** to get through all of the steps in the research project.

(___Yes, it's me)
(___No, not me)

Okay, you're ready to write your research proposal. Here are some ideas to help with the task:

✔8. **Read through someone else's research proposal.** Very often a real stumbling block is that we don't have an image in our mind of what the finished research proposal should look like. How has the other proposal been organized? What are the headings that have been used? Does the other proposal seem clear? Does it seem to suggest that the writer knows the subject area? Can I model my proposal after one of the ones that I've seen? If you can't readily find a proposal or two to look at, ask your adviser to see some. Chances are your adviser has a file drawer filled with them.

✔9. Make sure your proposal has a **comprehensive review of the literature** included. Now this idea, at first thought, may not seem to make sense. I have heard many students tell me that "This is only the proposal. I'll do a complete literature search for the dissertation. I don't want to waste the time now." But, this is the time to do it. The rationale behind the literature review consists of an argument with two lines of analysis: 1) this research is needed, and 2) the methodology I have chosen is most appropriate for the question that is being asked. Now, why would you want to wait? Now is the time to get informed and to learn from others who have preceded you! If you wait until you are writing the dissertation it is too late. You've got to do it some time so you might as well get on with it and do it now. Plus, you will probably want to add to the literature review when you're writing the final dissertation. (Thanks to a website visitor from Mobile, Alabama who helped to clarify this point.)

✔10. With the ready availability of photocopy machines you should be able to bypass many of the hardships that previous dissertation researchers had to deal with in developing their literature review. When you read something that is important to your study, **photocopy the relevant article or section.** Keep your photocopies organized according to categories and sections. And, most importantly, photocopy the bibliographic citation so that you can easily reference the material in your bibliography. Then, when you decide to sit down and actually write the literature review, bring out your photocopied sections, put them into logical and sequential order, and then begin your writing.

✔11. What is a proposal anyway? **A good proposal should consist of the first three chapters of the dissertation.** It should begin with a statement of the problem/background information (typically Chapter I of the dissertation), then move on to a review of the literature (Chapter 2), and conclude with a defining of the research methodology (Chapter 3). Of course, it should be written in a future tense since it is a proposal. To turn a good proposal into the first three chapters of the dissertation consists of changing the tense from future tense to past tense (from "This is what I would like to do" to "This is what I did") and making any changes based on the way you actually carried out the research when compared to how you proposed to do it. Often the intentions we state in our proposal turn out different in reality and we then have to make appropriate editorial changes to move it from proposal to dissertation.

✔12. **Focus your research very specifically.** Don't try to have your research cover too broad an area. Now you may think that this will distort what you want to do. This may be the case, but you will be able to do the project if it is narrowly defined. Usually a broadly defined project is not do-able. By defining too broadly it may sound better to you, but there is a great chance that it will be unmanageable as a research project. When you complete your research project it is important that you have something specific and definitive to say. This can be accommodated and enhanced by narrowly defining your project. Otherwise you may have only broadly based things to say about large areas that really provide little guidance to others that may follow you. Often the researcher finds that what he/she originally thought to be a good research project turns out to really be a

group of research projects. Do one project for your dissertation and save the other projects for later in your career. Don't try to solve all of the problems in this one research project.

✔13. **Include a title on your proposal.** I'm amazed at how often the title is left for the end of the student's writing and then somehow forgotten when the proposal is prepared for the committee. A good proposal has a good title and it is the first thing to help the reader begin to understand the nature of your work. Use it wisely! Work on your title early in the process and revisit it often. It's easy for a reader to identify those proposals where the title has been focused upon by the student. Preparing a good title means:

...having the most important words appear toward the beginning of your title,

...limiting the use of ambiguous or confusing words,

...breaking your title up into a title and subtitle when you have too many words, and

...including key words that will help researchers in the future find your work.

✔14. It's important that your **research proposal be organized around a set of questions** that will guide your research. When selecting these guiding questions try to write them so that they frame your research and put it into perspective with other research. These questions must serve to establish the link between your research and other research that has preceded you. Your research questions should clearly show the relationship of your research to your field of study. Don't be carried away at this point and make your questions too narrow. You must start with broad relational questions.

A good question:

Do adult learners in a rural adult education setting have characteristics that are similar to adult learners in general ?

A poor question:

What are the characteristics of rural adult learners in an adult education program? (too narrow)

A poor question:

How can the XYZ Agency better serve rural adult learners? (not generalizable)

✔15. Now here are a few more ideas regarding the defining of your research project through your proposal.

✔a. Make sure that you will be **benefitting those who are participating in the research.** Don't only see the subjects as sources of data for you to analyze. Make sure you treat them as participants in the research. They have the right to understand what you are doing and you have a responsibility to share the findings with them for their reaction. Your research should not only empower you with new understandings but it should also empower those who are participating with you.

✔b. **Choose your methodology wisely.** Don't be too quick in running away from using a quantitative methodology because you fear the use of statistics. A qualitative approach to research can yield new and exciting understandings, but it should not be undertaken because of a fear of quantitative research. A well designed quantitative research study can often be accomplished in very clear and direct ways. A similar study of a qualitative nature usually requires considerably more time and a tremendous burden to create new paths for analysis where previously no path had existed. Choose your methodology wisely!

✔c. Sometimes a **combined methodology** makes the most sense. You can combine a qualitative preliminary study (to define your population more clearly, to develop your instrumentation more specifically or to establish hypotheses for investigation) with a quantitative main study to yield a research project that works well.

✔d. Deciding on **where you will conduct the research** is a major decision. If you are from another area of the country or a different country there is often an expectation that you will return to your "home" to conduct the research. This may yield more meaningful results, but it will also most likely create a situation whereby you are expected to fulfill other obligations while you are home. For many students the opportunity to conduct a research project away from home is an important one since they are able to better control many of the intervening variables that they can not control at home. Think carefully regarding your own situation before you make your decision.

✔e. What if you have the opportunity for **conducting your research in conjunction with another agency or project** that is working in related areas. Should you do it? Sometimes this works well, but most often the dissertation researcher gives up valuable freedom to conduct the research project in conjunction with something else. **Make sure the trade-offs are in your favor.** It can be very disastrous to have the other project suddenly get off schedule and to find your own research project temporarily delayed. Or, you had tripled the size of your sample since the agency was willing to pay the cost of postage. They paid for the postage for the pre-questionnaire. Now they are unable to assist with postage for the post-questionnaire. What happens to your research? I usually find that the cost of conducting dissertation research is not prohibitive and the trade-offs to

work in conjunction with another agency are not in favor of the researcher. Think twice before altering your project to accommodate someone else. Enjoy the power and the freedom to make your own decisions (and mistakes!) -- this is the way we learn!

✔16. Selecting and preparing your advisory committee to respond to your proposal should not be taken lightly. If you do your "homework" well your **advisory committee can be most helpful to you.** Try these ideas:

✔a. If you are given the opportunity to select your dissertation committee do it wisely. Don't only focus on content experts. **Make sure you have selected faculty for your committee who are supportive of you** and are willing to assist you in successfully completing your research. You want a committee that you can ask for help and know that they will provide it for you. Don't forget, you can always access content experts who are not on your committee at any time during your research project.

✔b. **Your major professor/adviser/chairperson is your ally.** When you go to the committee for reactions to your proposal make sure your major professor is fully supportive of you. Spend time with him/her before the meeting so that your plans are clear and you know you have full support. The proposal meeting should be seen as an opportunity for you and your major professor to seek the advice of the committee. Don't ever go into the proposal meeting with the feeling that it is you against them!

✔c. **Provide the committee members with a well-written proposal** well in advance of the meeting. Make sure they have ample time to read the proposal.

✔d. **Plan the proposal meeting well.** If graphic presentations are necessary to help the committee with understandings make sure you prepare them so they look good. A well planned meeting will help your committee understand that you are prepared to move forward with well planned research. Your presentation style at the meeting should not belittle your committee members (make it sound like you know they have read your proposal) but you should not assume too much (go through each of the details with an assumption that maybe one of the members skipped over that section).

Writing the Thesis or Dissertation

Now this is the part we've been waiting for. I must assume that you have come up with a good idea for research, had your proposal approved, collected the data, conducted your analyses and now you're about to start writing the dissertation. If you've done the first steps well this part shouldn't be too bad. In fact it might even be enjoyable!

✔17. The major myth in writing a dissertation is that you start writing at Chapter One and then finish your writing at Chapter Five. This is seldom the case. The most productive approach in writing the dissertation is to **begin writing those parts of the dissertation that you are most comfortable with.** Then move about in your writing by completing various sections as you think of them. At some point you will be able to spread out in front of you all of the sections that you have written. You will be able to sequence them in the best order and then see what is missing and should be added to the dissertation. This way seems to make sense and builds on those aspects of your study that are of most interest to you at any particular time. Go with what interests you, start your writing there, and then keep building!

(David Kraenzel - North Dakota State University - wrote in describing the "A to Z Method". Look at the first section of your paper. When you are ready go ahead and write it. If you are not ready, move section-by-section through your paper until you find a section where you have some input to make. Make your input and continue moving through the entire paper - from A to Z - writing and adding to those sections for which you have some input. Each time you work on your paper follow the same A to Z process. This will help you visualize the end product of your efforts from very early in your writing and each time you work on your paper you will be building the entire paper - from A to Z. Thanks David!)

✔18. If you prepared a comprehensive proposal you will now be rewarded! Pull out the proposal and begin by checking your proposed research methodology. Change the tense from future tense to past tense and then make any additions or changes so that the methodology section truly reflects what you did. You have now been able to **change sections from the proposal to sections for the dissertation.** Move on to the Statement of the Problem and the Literature Review in the same manner.

✔19. I must assume you're using some form of word processing on a computer to write your dissertation. (if you aren't, you've missed a major part of your doctoral preparation!) If your study has specific names of people, institutions and places that must be changed to provide anonymity don't do it too soon. Go ahead and **write your dissertation using the real names.** Then at the end of the writing stage you can easily have the computer make all of the appropriate name substitutions. If you make these substitutions too early it can really confuse your writing.

✔20. As you get involved in the actual writing of your dissertation you will find that conservation of paper will begin to fade away as a concern. Just as soon as you print a draft of a chapter there will appear a variety of needed changes and before you know it another draft will be printed. And, it seems almost impossible to throw away any of the drafts! After awhile it will become extremely difficult to remember which draft of your chapter you may be looking at. **Print each draft of your dissertation on a different color paper.** With the different colors of paper it will be easy to see which is the latest draft and you can quickly see which draft a committee member might be reading. (Thanks to Michelle O'Malley at University of Florida for sharing this idea.)

✔21. The one area where I would caution you about using a word processor is in the

creation of elaborate graphs or tables. I've seen too many students spend too many hours in trying to use their word processor to create a graph that could have been done by hand in 15 minutes. So, the simple rule is to **use hand drawing for elaborate tables and graphs for the draft of your dissertation.** Make sure your committee can clearly understand your graph, but don't waste the time trying to make it perfect. After you defend your dissertation is the time to prepare the "perfect" looking graphs and tables.

✔22. Dissertation-style writing is not designed to be entertaining. **Dissertation writing should be clear and unambiguous.** To do this well you should prepare a list of key words that are important to your research and then your writing should use this set of key words throughout. There is nothing so frustrating to a reader as a manuscript that keeps using alternate words to mean the same thing. If you've decided that a key phrase for your research is "educational workshop", then do not try substituting other phrases like "in-service program", "learning workshop", "educational institute", or "educational program." Always stay with the same phrase - "educational workshop." It will be very clear to the reader exactly what you are referring to.

✔23. **Review two or three well organized and presented dissertations.** Examine their use of headings, overall style, typeface and organization. Use them as a model for the preparation of your own dissertation. In this way you will have an idea at the beginning of your writing what your finished dissertation will look like. A most helpful perspective!

✔24. A simple rule - if you are presenting information in the form of a table or graph **make sure you introduce the table or graph in your text.** And then, following the insertion of the table/graph, make sure you discuss it. If there is nothing to discuss then you may want to question even inserting it.

✔25. Another simple rule - **if you have a whole series of very similar tables try to use similar words in describing each.** Don't try and be creative and entertaining with your writing. If each introduction and discussion of the similar tables uses very similar wording then the reader can easily spot the differences in each table.

✔26. We are all familiar with how helpful the Table of Contents is to the reader. What we sometimes don't realize is that it is also invaluable to the writer. **Use the Table of Contents to help you improve your manuscript.** Use it to see if you've left something out, if you are presenting your sections in the most logical order, or if you need to make your wording a bit more clear. Thanks to the miracle of computer technology, you can easily copy/paste each of your headings from throughout your writing into the Table of Contents. Then sit back and see if the Table of Contents is clear and will make good sense to the reader. You will be amazed at how easy it will be to see areas that may need some more attention. Don't wait until the end to do your Table of Contents. Do it early enough so you can benefit from the information it will provide to you.

✔27. If you are including a Conclusions/Implications section in your dissertation **make**

sure you really present conclusions and implications. Often the writer uses the conclusions/implications section to merely restate the research findings. Don't waste my time. I've already read the findings and now, at the Conclusion/Implication section, I want you to help me understand what it all means. This is a key section of the dissertation and is sometimes best done after you've had a few days to step away from your research and allow yourself to put your research into perspective. If you do this you will no doubt be able to draw a variety of insights that help link your research to other areas. I usually think of conclusions/implications as the "So what" statements. In other words, what are the key ideas that we can draw from your study to apply to my areas of concern.

✔28. Potentially the silliest part of the dissertation is the Suggestions for Further Research section. This section is usually written at the very end of your writing project and little energy is left to make it very meaningful. The biggest problem with this section is that the suggestions are often ones that could have been made prior to you conducting your research. **Read and reread this section until you are sure that you have made suggestions that emanate from your experiences** in conducting the research and the findings that you have evolved. Make sure that your suggestions for further research serve to link your project with other projects in the future and provide a further opportunity for the reader to better understand what you have done.

✔29. Now it's time to write the last chapter. But what chapter is the last one? My perception is that **the last chapter should be the first chapter.** I don't really mean this in the literal sense. Certainly you wrote Chapter One at the beginning of this whole process. Now, at the end, it's time to "rewrite" Chapter One. After you've had a chance to write your dissertation all the way to the end, the last thing you should do is turn back to Chapter One. Reread Chapter One carefully with the insight you now have from having completed Chapter Five. Does Chapter One clearly help the reader move in the direction of Chapter Five? Are important concepts that will be necessary for understanding Chapter Five presented in Chapter One?

The Thesis/Dissertation Defense

What a terrible name - ***a dissertation defense.*** It seems to suggest some sort of war that you're trying to win. And, of course, with four or five of them and only one of you it sounds like they may have won the war before the first battle is held. I wish they had called it a dissertation seminar or professional symposium. I think the name would have brought forward a much better picture of what should be expected at this meeting.

Regardless of what the meeting is called, try to remember that the purpose of the meeting is for you to show everyone how well you have done in the conducting of your research study and the preparation of your dissertation. In addition there should be a seminar atmosphere where the exchange of ideas is valued. You are clearly the most knowledgeable person at this meeting when it comes to your subject. And, the members of your committee are there to hear from you and to

help you better understand the very research that you have invested so much of yourself in for the past weeks. Their purpose is to help you finish your degree requirements. Of course other agenda often creep in. If that happens, try to stay on course and redirect the meeting to your agenda.

The following ideas should help you keep the meeting on your agenda.

✔30. The most obvious suggestion is the one seldom followed. **Try to attend one or more defenses prior to yours.** Find out which other students are defending their research and sit in on their defense. In many departments this is expected of all graduate students. If this is not the case for you, check with your adviser to see that you can get an invitation to attend some defenses.

At the defense try and keep your focus on the interactions that occur. Does the student seem relaxed? What strategies does the student use to keep relaxed? How does the student interact with the faculty? Does the student seem to be able to answer questions well? What would make the situation appear better? What things should you avoid? You can learn a lot from sitting in on such a meeting.

✔31. Find opportunities to **discuss your research with your friends and colleagues.** Listen carefully to their questions. See if you are able to present your research in a clear and coherent manner. Are there aspects of your research that are particularly confusing and need further explanation? Are there things that you forgot to say? Could you change the order of the information presented and have it become more understandable?

✔32. I hope you **don't try circulating chapters of your dissertation to your committee members as you are writing them.** I find this practice to be most annoying and one that creates considerable problems for the student. You must work closely with your dissertation director. He/she is the person you want to please. Develop a strategy with the dissertation director regarding how and when your writing should be shared. Only after your dissertation director approves of what you have done should you attempt to share it with the rest of the committee. And by then it's time for the defense. If you prematurely share sections of your writing with committee members you will probably find yourself in a situation where one committee member tells you to do one thing and another member says to do something else. What should you do? The best answer is not to get yourself into such a predicament. The committee meeting (the defense) allows the concerns of committee members to surface in a dialogical atmosphere where opposing views can be discussed and resolved.

✔33. It's important that you have the feeling when entering your defense that **you aren't doing it alone.** As was mentioned earlier, your major professor should be seen as an ally to you and "in your corner" at the defense. Don't forget, if you embarrass yourself at the defense you will also be embarrassing your dissertation director. So, give both of you a chance to guarantee there is no embarrassment. Meet together ahead of time and discuss

the strategy you should use at the defense. Identify any possible problems that may occur and discuss ways that they should be dealt with. Try and make the defense more of a team effort.

✔34. **Don't be defensive at your defense** (this sounds confusing!). This is easy to say but sometimes hard to fulfill. You've just spent a considerable amount of time on your research and there is a strong tendency for YOU to want to defend everything you've done. However, the committee members bring a new perspective and may have some very good thoughts to share. Probably the easiest way to deal with new input is to say something like "Thank you so much for your idea. I will be giving it a lot of consideration." There, you've managed to diffuse a potentially explosive situation and not backed yourself or the committee member into a corner. Plus, you've not promised anything. Try and be politically astute at this time. Don't forget that your ultimate goal is to successfully complete your degree.

✔35. Probably the most disorganized defense I've attended is the one where the dissertation director began the meeting by saying, "You've all read the dissertation. What questions do you have for the student?" What a mess. Questions started to be asked that bounced the student around from one part of the dissertation to another. There was no semblance of order and the meeting almost lost control due to its lack of organization. At that time I vowed to protect my students from falling into such a trap by helping them **organize the defense as an educational presentation.**

Here's what we do:

> I ask the student to prepare a 20-25 minute presentation that reviews the entire study. This is done through the help of a series of 10-12 large pieces of paper, wall charts, that have been posted sequentially around the walls of the room. Each piece of paper contains key words regarding each of the different aspects of the study. Some pieces of paper contain information about the study setting, questions and methodology. Other pieces of paper present findings and finally there are those pieces that present the conclusions and implications. By preparing these wall charts ahead of time the student is able to relax during the presentation and use the pieces of paper as if they were a road map toward the goal. No matter how nervous you are you can always let the wall charts guide **YOU** through your presentation. Lettering is done with a dark marking pen and extra notes are included in very small printing with a pencil (that no one can really see). We've also tried it with overhead projected transparencies but it doesn't work as well. With the transparencies they're gone from view after a few seconds. The wall charts stay up for everyone to see and to help focus attention.
>
> Following this structured presentation the committee begins to ask questions, but as can be expected the questions follow along with the wall charts and the whole discussion proceeds in an orderly manner. If guests are present at the defense, this

form of presentation helps them also follow along and understand exactly what was accomplished through the research.

✔36. **Consider tape recording your defense.** Using a small portable recorder, record your entire presentation and also the questions and comments of the committee members. This helps in two ways. First, the student has documentation to assist in making suggested changes and corrections in the dissertation. The student can relax more and listen to what is being said by the committee members. The tape recorder is taking notes! Second, the student has a permanent record of his/her presentation of the study. By keeping the paper charts and the tape together, they can be most useful for reviewing the research in future years when a request is made for a presentation. (Bring out the tape and the pieces of paper the night before your presentation and you can listen to you make the presentation. What a good way to review.)

Well that about does it. By following the above suggestions and ideas I hope it will be possible for you to finish your graduate degree program in a most timely and enjoyable manner. By looking ahead to the different aspects of this final part of your graduate study it becomes clear that you can do a number of things to insure your success. Good luck!

✔37. Oh, I almost forgot. There's one last thing. Get busy and **prepare an article or paper that shares the outcomes of your research.** There will be no better time to do this than now. Directly after your defense is when you know your study the best and you will be in the best position to put your thinking on paper. If you put this writing task off it will probably never get done. Capitalize on all of the investment you have made in your research and reap some additional benefit - start writing.

GUIDE FOR WRITING A FUNDING PROPOSAL

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(Last Updated:)

This **Guide for Writing a Funding Proposal** was created to help empower people to be successful in gaining funds for projects that provide worthwhile social service. A major theme that runs throughout the **Guide** is a concern for the development of meaningful cooperative relationships - with funding agencies, with community organizations, and with the people you are serving - as a basis for the development of strong fundable initiatives. The **Guide** is built on the assumption that it is through collaboration and participation at all levels that long term change can be affected.

To make this **Guide** as useful as possible, all suggestions have been carefully reviewed with a concern that they be easy to implement and can have the greatest positive effect on the creation of a funding proposal. (This is the same design concern that I used for the creation of the companion guide for graduate students - **Guide for Writing and Presenting Your Thesis or Dissertation**). Long orations are minimized and suggestions are presented in a direct and clear manner. Actual proposal examples are included so that you can easily see the different suggestions demonstrated.

As you are going through this **Guide** you will probably see things that aren't clear, need fixing, or should be further clarified. Please send them along and I will do my best to improve the **Guide** based upon your ideas. I try to make major revisions in the Guide at least 2-3 times each year. Your suggestions on how to improve this **Guide** will be most appreciated

And finally, I receive many requests asking me to recommend a book or two that would be helpful in writing a good proposal. I've started to create such a listing of books I've identified and my review of each of them. Feel free to check out my **Selection of Books to Help with the Preparation of a Funding Proposal**.

Enjoy using this **Guide** and I hope it brings you good luck as you seek funding for your ideas!

Joe Levine (levine@msu.edu)

Proposal Section		
TITLE	Writing Hints	Example
PROJECT OVERVIEW	Writing Hints	Example
BACKGROUND INFORMATION/ STATEMENT OF THE PROBLEM	Writing Hints	Example
PROJECT DETAIL		
- Goals &Objectives	Writing Hints	Example
- Clientele	Writing Hints	Example
- Methods	Writing Hints	Example
- Staff/Administration	Writing Hints	Example
AVAILABLE RESOURCES	Writing Hints	Example
NEEDED RESOURCES		
- Personnel	Writing Hints	Example
- Facilities	Writing Hints	Example
- Equipment/Supplies/Communication	Writing Hints	Example
- Budget	Writing Hints	Example

EVALUATION PLAN	Writing Hints	Example
APPENDICES	Writing Hints	Example

View the entire proposal example

View all of the writing hints

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A Selection of Books on Proposal Writing

Links to Other Proposal Writing Resources

Background information on how this Guide was prepared

Companion Guide
Writing and Presenting Your Thesis or Dissertation

Return to the Guide for Writing a Funding Proposal

Meet & interact with Joe Levine at his upcoming Online Workshop:

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Guide for Writing a Funding Proposal

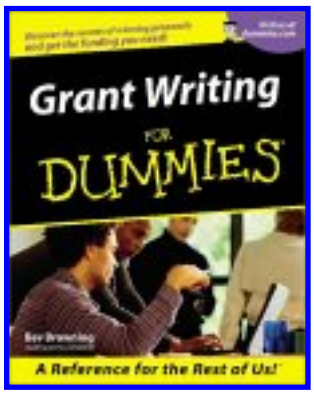
A selection of books to help with the preparation of a funding proposal.

(Last Updated:)

I am in the process of reviewing a number of the books that are currently available to help in the preparation of a funding proposal. The books that I am focusing on for the first round of reviews are shown below. If all goes according to my plan the reviews will soon begin to appear.

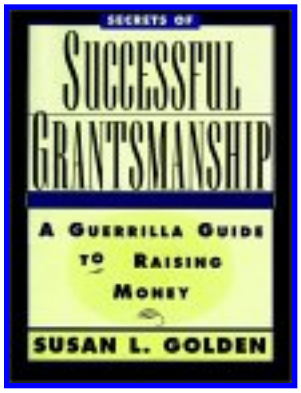
Clicking on the title or image of each book will take you directly to Amazon.com where the book can be purchased. If you are so inclined to purchase one of these books via the link a small commission will be earned and used to help offset some of the costs associated with maintaining this website. Thank you!

Joe Levine



Grant Writing for Dummies by Beverly A. Browning.

I've never been very amused with the "_____ for Dummies" titles used for so many reference books and was prepared to quickly dismiss this one as just another attempt to sell a book. However, once I started looking through this 300 page volume I found myself not wanting to put it down! It seemed that author Browning had a well written response for just about any question I could think of. And, she did it in a very clear and succinct way. Page after page presented idea after idea on how to craft a proposal that would garner the attention of a potential funding organization. I found myself wondering how it was possible that one person could have considered so many different aspects involved with writing a proposal. The book uses a system of margin graphics to key you to important concerns - such things as **Tips**, things to **Remember**, and **Warning**. The book is divided into chapters that are presented in the order in which the ideas need to be considered when preparing a proposal - **Powering Up...**, **Understanding the Rules...**, **Putting Together Your Grant Application**, **Reaching the Finish Line...**, etc. I especially liked Part V of the book - **The Part of Tens** - which includes a series a chapters, each providing a set of 10 key ideas (**Ten Ways to Personalize Your Request**, **Ten Grant Writing No-No's**, **Ten Data Collection Tips**, etc.) The book concludes with two complete examples of Grant Application Narratives so you can see what a good proposal looks like. Truely an excellent reference manual that you will find yourself using over and over again - each time discovering new ideas to help in the preparation of a grant proposal.



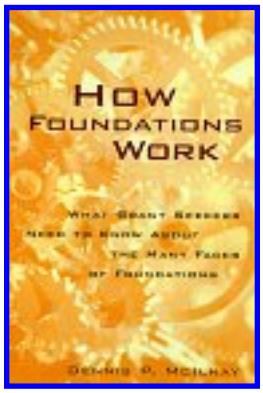
Secrets of Successful Grantsmanship : A Guerrilla Guide to Raising Money by Susan L. Golden.

This book takes a very different approach to the whole challenge of procuring grants. Rather than focusing on the steps that go into writing a proposal, author Golden puts the emphasis (and appropriately so!) on building a strong foundation that is concerned with doing everything possible to get the needed funding - how to conduct effective prospect research, opening the right doors, making your first conversation count, the proposal meeting with a prospective funder, etc. Finally, in Chapter 7 the attention turns to "Preparing and Submitting Your Grant Proposal." However, by that time the point has been made - **procuring funding for your project is a lot more than just preparing a written proposal**. Personal experiences are shared to help clarify points, along with lots of good ideas and examples on how to successfully gain support for your project.

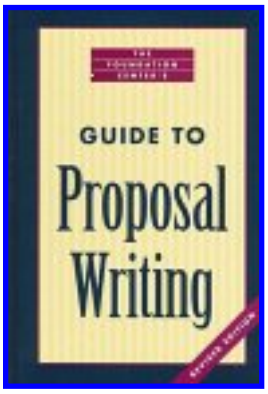
Winning Grants Step by Step : Support Centers of America's Complete Workbook for Planning, Developing, and Writing Successful Proposals by Mim Carlson.

This workbook provides information on each of the parts of a proposal (Need Statement, Objectives, Methods, Evaluation, Budget & Future Funding) and then provides a worksheet for each section to assist the reader in developing a first draft of his/her own proposal. Ideally, once you have made your way through each of the worksheets you will have a well designed proposal ready to submit to a funding organization. Instead, I think the reality is that you will have thought through a number of important questions but you still will not have your proposal. This workbook has good intentions but it does not quite get you to the "finish line." Potentially one of the most valuable features is the checklist that comes at the end of each step/chapter in the workbook. These short overviews help you consider some of the things you may have forgotten as you rate that step in the writing. (The Budget checklist includes such reminders as, "Is consistent with the proposal narrative," and "Includes in-kind donations," etc.)

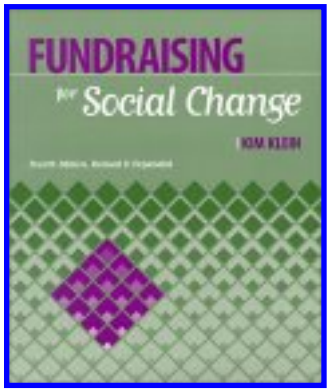
I'll Grant You That : A Step-By-Step Guide to Finding Funds, Designing Winning Projects, and Writing Powerful Proposals by Jim Burke and Carol Ann Prater.



How Foundations Work : What Grantseekers Need to Know About the Many Faces of Foundations by Dennis A. McIlnay.



The Foundation Center's Guide to Proposal Writing by Patricia McNeill, Jane C. Geever.



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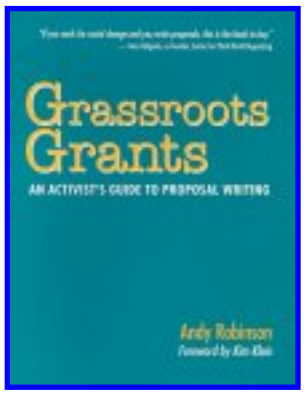

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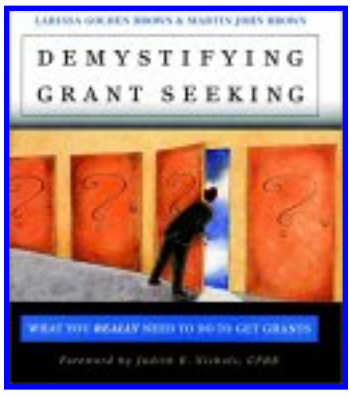

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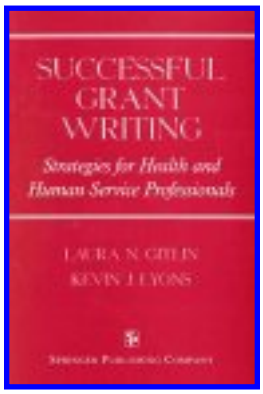

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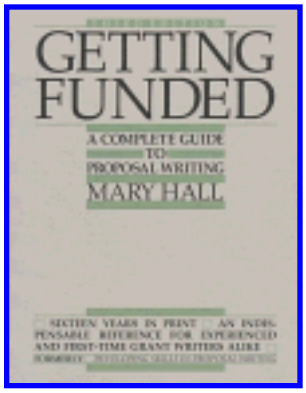

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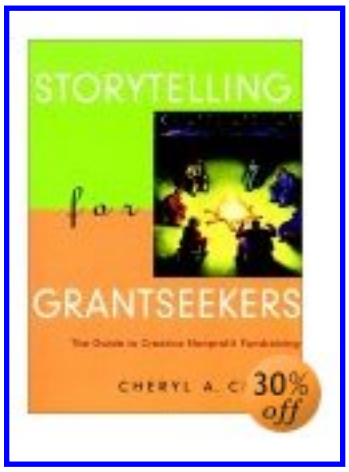

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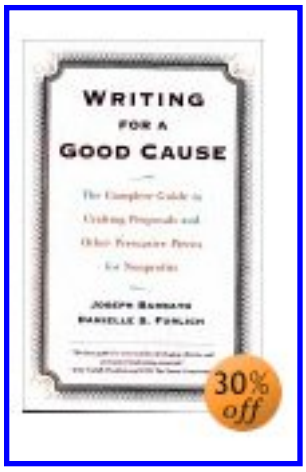

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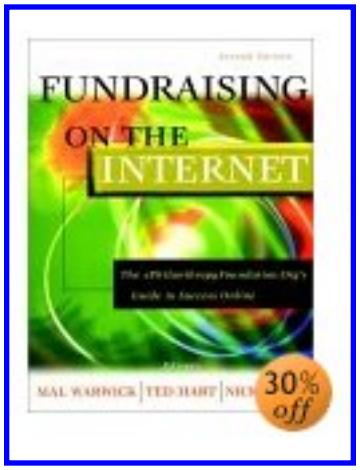

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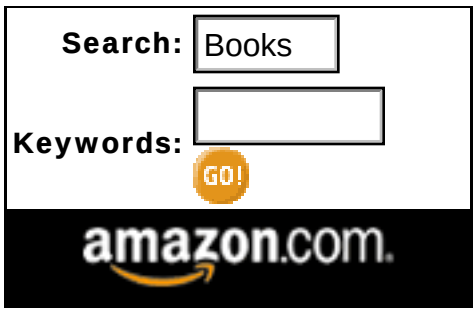

Return to Guide for Writing a Funding Proposal

GUIDE FOR WRITING A FUNDING PROPOSAL

Writing Hints:

Project Title

✔ Check to see if the agency you have in mind has any specifications for the Title Page (often they have a required format).

✔ Usually the Title/Cover Page includes signatures of key people in your organization (Department Head, Supervisor, Contracts Officer, etc.).

✔ If your proposal is built on collaborating with other groups/organizations it is usually a good idea to include their names on the Title/Cover Page.

✔ Your cover should look professional and neat. However, do not waste time using fancy report covers, expensive binding, or other procedures that may send the wrong message to the potential funding agency. You are trying to impress the potential funding agency with how you really need funding, not the message that you do things rather expensively!

✔ The title should be clear and unambiguous (do not make it "cute").

✔ Think of your title as a mini-abstract. A good title should paint a quick picture for the reader of the key idea(s) of your project.

✔ The words you use in your title should clearly reflect the focus of your proposal. The most important words should come first, then the less important words. Notice that both of the following titles use basically the same words, except in a different order. The project with Title #1 appears to be focused on *Red Haired Musicians*. The project with Title #2 appears to be focused on *Musical Style Preference*. However, both projects are the same! Make sure your words are in the correct order.

Title #1 - **Red Haired Musicians and their Preference for Musical Style**

Title #2 - **Music Style Preference of Red Haired Musicians**

✔ Try to remove words from your title that really are not necessary for understanding. Title #1 has too many words. Title #2 is just as clear but with fewer words.

Title #1 - **The Systematic Development of a Local Initiative to Create a Learning Center for Community Education**

Title #2 - **A Local Learning Center for Community Education**

✔ Try and use only a single sentence for your title. If the sentence is getting too long try removing some words. When all else fails try using a two part title with the parts separated by a colon (use only as a last resort!). Do not attempt to use the title as an abstract of your entire proposal.

Return to the Guide for Writing a Funding Proposal

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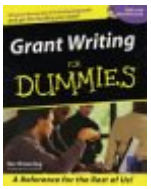

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How to Succeed in Postgraduate Study

Marie desJardins [marie@erg.sri.com]

Abstract:

This paper attempts to raise some issues that are important for postgraduate students to be successful and to get as much out of the process as possible, and for supervisors who wish to help their students be successful. The intent is not to provide prescriptive advice -- no formulas for finishing a thesis or twelve-step programs for becoming a better supervisor are given -- but to raise awareness on both sides of the supervisor-student relationship as to what the expectations are and should be for this relationship, what a postgraduate student should expect to accomplish, common problems, and where to go if the supervisor is not forthcoming.

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Notes on Writing Papers and Theses

Ken Lertzman, School of Resource and Environmental Management, Simon Fraser University, British Columbia

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Introduction

Many theses and class papers share a common set of problems in their early drafts. In response to this observation, I began a set of notes based on my repeated comments on student writing over a period of several years. These notes eventually grew into a document that I include as a part of course packages and give to students preparing theses. I was surprised to discover that even graduate students often find it difficult to identify problems in their writing and frequently lack tools to deal with the m effectively. The following 21 suggestions should be relevant to both undergraduate and graduate students. Apparently few students, at any level, have received much instruction in the strategies and tactics for effective scientific writing. Though the s uggestions I make here are based primarily on my comments on student papers and theses, they also reflect common problems in manuscripts I receive for review.

Know your audience and write for that specific audience.

Scientific and technical writing can almost never be "general purpose"; it must be written for a specific audience. For the kinds of writing I address here, that audience will generally be the community of ecologists who read a particular- journal or s tudy a particular subject. For class papers, this community is represented by your professor. In all cases, you must adopt the style and level of writing that is appropriate for your audience.

Stylistic conventions and acceptable jargon can vary tremendou sly from one field to another, and to some extent, from one journal to another. If you are unfamiliar with the conventions of a field, study them as they are manifested in a selection of highly regarded papers and in the "Instructions for Authors" for ke y journals.

Your supervisor/professor is not here to teach you basic grammar and spelling

The more time and emotional energy she or he spends on correcting basic English usage, the less remains for issues of content or fine-tuning. You are responsible for mastering the basics of the language; save your supervisor's time for more substantive issues. A few glitches and non-parallel tenses will slip through your own careful editing, but there is no excuse for frequent ungrammatical sentences. Similarly, with word processors and spell-checkers having become standard writing tools, typos or othe r spelling errors should be very rare. Use a spelling checker before submitting anything for anyone else's reading.

If you find you are about to submit a paper that you know contains poor writing, consider why you are doing so. If there is a writing problem with which you are having a hard time (for instance, organizing the structure of an argument in its most effec tive form), it is legitimate to submit this for someone else's review with the problem highlighted as a focused request for assistance. Otherwise, submitting a piece of writing with known errors or problems means either: (1) you do not consider your wri ting worth improving, (2) you do not respect the reader enough to present writing that is as good as you can make it, or (3) you are incapable of improving the writing. At some point, every piece of writing is as good as its writer can make it without out side review.-That is the time to give it to your supervisor.

Do not turn in a first draft!-- Ever!

Most people's first drafts are terrible. I wouldn't make anyone else suffer through mine. Don't make others suffer through yours. I've read early drafts of papers by eminent ecologists whose final products are jewels of English construction. Their fir st drafts are terrible too. "Good writing is rewriting," and you should make a serious effort at editing, rewriting, and

fine-tuning before you give the manuscript to anyone else to read. There are few things more frustrating to read than a paper in which you know there are pearls of wisdom, but where those pearls are hidden by sloppy and ambiguous writing. The chapters of my Ph.D. thesis had been through 3-5 drafts before anyone on my advisory committee ever saw them. If you need to put a piece of writin g away for a few days before you can approach it dispassionately enough to rework it, do so. It takes much longer to read poor writing than good writing. it is a waste of an advisor's or editor's time to read material that i

Consider forming a mutual editing team with other students to review each other's work. Publication quality scientific writing is usually a product of the research community rather than the sole effort of the author (s): reviewers and editors make a big difference to the vast majority of published papers. You should become accustomed both to reviewing other people's work and to having your own reviewed.

Get and use style books

All aspiring ecologists should have a library of books that supports their technical communication. Distinguish between those that are primarily manuals of accepted rules, those that address how to create a draft (e.g., disconnecting the creative from the critical voice, etc.), and those that focus on rewriting. I recommend Williams (1990) as a manual for rewriting. Williams focuses on how to turn a draft into a finished product.

Avoid passive constructions wherever possible

The rule that you must avoid personal pronouns is antiquated and has been rejected by most scientific journals. If you collected the data using Smerdyakoff's Bicranial Olfactory Apparatus, there is nothing wrong with saying, "I collected the data using Smerdyakoff's Bicranial Olfactory Apparatus." Where it would be repetitive to use personal pronouns ("I did this. I did that. I did the other thing."), or where it makes the sentence more awkward to use the active voice, you may occasionally, cautiously use the passive voice.

Avoid abusing word forms

Use words in the form that conveys your meaning as clearly and simply as possible. A variety of writing problems arise from using verbs and adjectives as nouns. Such word forms are called nominalizations (Williams 1990). Consider the sentence, "The low rate of encounters was a reflection of the reduction in population density." The verbs, "to reflect" and "to reduce" are used as nouns, and the sentence is more turgid and less direct than when they are used as verbs: "The low rate of encounters reflects a reduced population density." Some nominalizations are both useful and effective, as in "taxation without representation." Williams (1990) has an excellent discussion of useless and useful nominalizations.

Creating awkward phrases where nouns and verbs are used as adjectives or adverbs is another common problem leading to awkward and wooden writing. In his delightful critique, Hildebrand (1981) called nouns used this way "adjectival nouns." Such constr uctions are almost invariably clumsy and unclear. For instance, unless specifically referring to a document, "the Chilko Lake park proposal" is not as good as "the proposal for a park at Chilko Lake." The first form illustrates both a nominalization ("pro posal" as noun vs. verb) and adjectival nouns ("Chilko Lake" and "park" as adjectives modifying "proposal" rather than nouns). Table 1 provides examples of adjectival nouns culled from papers and theses I read during o ne month. It is distressingly easy to find awkward strings of adjectival nouns in published papers, where they are common in titles. Phrases built with one adjectival noun or verb are often useful (e.g., "hair pin," "gut contents," "sampling unit"), but t hose with more are usually awkward, rarely n

Do not use more words where fewer will do

Do not use long words where short ones will do. Do not use jargon where regular language will do. Do not use special words to make your writing seem more technical, scientific, or academic when the message is more clearly presented otherwise.

Use an outline to organize your ideas and writing.

When you first start a writing project, make an outline of the major

headings. List the key ideas to be covered under each heading. Organize your thinking and the logic of your arguments at this level, not when you are trying to write complete, grammat ical, and elegant sentences. Separate out the three tasks of: (1) figuring out what you want to say, (2) planning the order and logic of your arguments, and (3) crating the exact language in which you will express your ideas.

Many people find it useful when making an outline to attach page lengths and time lines to each subsection. For instance, section 2.4 may be "Evidence for differential use of canopy gaps by Clethrionomys." To this you might append, '3 more days analysi s, 4 days writing; 10 pages." Such time estimates are usually inaccurate, but the process of establishing them is quite useful.

It is very easy to write and expand outlines with word processors. When starting a writing project, I create a file in which I first develop an outline as described above. I save a copy of the outline separately and then commence the writing by expandi ng the outline section-by-section. I usually get ideas for later sections while writing earlier ones and can easily page down and write myself notes under later section headings. This is especially useful for filling out the structure of a Discussion whil e writing the Results. (For instance, "When discussing the removal experiment, don't forget to contrast Karamozov's 1982 paper-- his Table 3--with the astonishing results in Figure 7.") By the time I get to writing the Discussion, the outline has usually been fleshed out substantially and most of the topic sentences are present in note form.

Think about the structure of paragraphs

Poorly structured paragraphs are one of the most common problems I find in graduate student writing. Though most graduate students can write reasonable sentences, a surprising number have difficulty organizing sentences into effective paragraphs. A par agraph should begin with a topic sentence that sets the stage clearly for what will follow. One of my most frequent comments on student papers is that the contents of a paragraph do not reflect the topic sentence. Make topic sentences short and direct. Bu ild the paragraph from the ideas introduced in your topic sentence and make the flow of individual sentences follow a logical sequence.

Many writers try to finish each paragraph with a sentence that forms a bridge to the next paragraph. Paying attention to continuity between

paragraphs is a good idea. However, such sentences are often better as a topic sentence for the following paragr aph than a concluding sentence of the current one. It is nice to conclude a paragraph by recapitulating its main points and anticipating what follows, but you should avoid statements of conclusion or introduction which contain no new information or ideas.

Strive for parallelism in structure at all times. When you present a list of ideas that you will then explore further ("Three hypotheses may account for these results: hypothesis 1, hypothesis 2, hypothesis 3."), make sure that you then address the ide as in the same sequence and format in which you have presented them initially. It is both confusing and frustrating to read a list presented as "1, 2, 3, 4" and then find the topics dealt with "1, 4, 3, 2."

Think about how the structure of your paragraphs will appear to the reader who is reading them for the first time. She should not have to read the text more than once to understand it. Carefully lead the reader along so that the structure of your argum ent as a whole is clear, as well as where the current text fits in it.

Paragraphs containing only one or two sentences are rarely good paragraphs because they can't develop ideas adequately. Two-sentence paragraphs usually represent either misplaced pieces of other paragraphs or fragments of ideas that should be removed o r expanded.

Choppiness both within and among paragraphs often results from the ease with which we can cut and paste text on the computer. Ideas that were written separately but belong together can be moved easily. Unfortunately, they often still read as if they we re written separately. This is a great way to structure a draft. However, you must read over such text for continuity before submitting it to others for review.

It is difficult to read for continuity on the computer screen because you can see so little text in front of you at any given moment. It is also more difficult to flip over several pages to scan for repetition, parallel structure, etc. To do a really g ood job of proofing a paper, most writers find it necessary to read hard copy at some point during the writing/ rewriting process. Print all but final drafts on paper that has been used previously on one side.

Pay attention to tenses

Problems of inappropriate or inconsistent tenses are common in student writing. What you, or others, did in the past should be stated in the past tense (e.g., "I collected these data . . ."). Events or objects that continue to happen or exist can be de scribed in the present tense (e.g., "In this paper I examine . . ."; "The data reject the hypothesis that . . ."). Events that will take place in the future can be in the future tense. Whatever tense you choose, be consistent. Be careful in using "might," "may," and "would" (as in "this might indicate that . . ."). They are frequently used as ways of weaseling out of making a clear statement.

Captions

Captions shouldn't merely name a table or figure, they should explain how to read it.--A caption should contain sufficient information so that a reader can understand a table or figure, in most cases, without reference to the text. While very simple t ables and figures may require only a title for clarity, and exceptionally complex ones may require reference to the text for explanation, these circumstances are rare. Captions are often most effective when they briefly summarize the main result presented in the table or figure (for example see the caption for Table 1). Don't leave caption writing to the end of the project; write captions when you organize your Results section and it will help you write the text.

When citing a reference, focus on the ideas, not the authors

Unless the person who reported a result is an important point in a statement, literature citations should be parenthetical, rather than in the body of the sentence. For instance, in most cases, it is preferable to write a sentence, of the form "Though mean growth rates in Idaho were <10 cm per year (Table 2), growth rates of >80 cm are common in populations in Alberta (Marx 1982)." rather than "Though mean growth rates in Idaho were <10 cm per year (Table 2), Marx (1982) found growth rates of >80 cm to be common in populations in Alberta." Sometimes the identity of the writer is important to the meaning of a statement, in which case emphasis on the citation is appropriate (e.g., "While Jones (1986) rejected this hypothesis, Meany's (1990) reanalysis of his data failed to do so.").

Show us don't tell us

Rather than telling the reader that a result is interesting or significant, show them how it is interesting or significant. For instance, rather than "The large difference in mean size between population C and population D is particularly interesting," write "While the mean size generally varies among populations by only a few centimetres, the mean size in populations C and D differed by 25 cm. Two hypotheses could account for this, . . ." Rather than describing a result, show the reader what they need to know to come to their own conclusion about it.

Write about your results, not your tables, figures, and statistics

Confusing and disjointed Results sections often arise because the writer does not have a clear idea of the story she/he intends to tell. The frequent consequence of this is a Results section consisting of a long, seemingly unrelated sequence of tables and figures. We often go through a lengthy and convoluted process in understanding the content of a data set; your paper needn't document all the twists and turns of that process. Expect that you will produce many more figures and perform many more statis tical tests than will be included in the final written product. When preparing to write your results, decide on the elements of the story you wish to tell then choose the subset of text, figures, and tables that most effectively and concisely conveys your message. Organize this subset of tables and figures in a logical sequence; then write your story around them.

Novice writers of scientific papers frequently pay too little attention to discussing the content of tables and figures. They sometime merely present a list of references (e.g., "Table I shows this result, Table 2 shows that result, Figure I shows the other result."). When writing Results sections you should use the tables and figures to illustrate points in the text, rather than making them the subject of your text. Rather than writing, "Figure 4 shows the relationship between the numbers of species A and species B," write "The abundances of species A and B were inversely related (Figure 4)." Distinguish between your scientific results and the methodological tools used to support and present those results.

Focus on ecological hypotheses not statistical hypotheses

Most graduate students have learned the importance of having and testing clear hypotheses. Unfortunately, many focus their writing on statistical hypotheses, not ecological hypotheses. Statistical hypotheses are generally a trivial consequence of stand ard approaches to statistical inference, such as the null hypothesis of no difference between two populations. They rarely have inherent ecological significance and are meaningful only in the context of the specific test being performed. Focus your writin g on the ecological hypotheses underlying your research (e.g., that species A is influenced by processes X and Y in a specific way, resulting in different growth rates in habitats S and T), not the statistical null hypotheses required to test specific pre dictions of those ecological hypotheses (e.g., there is no difference in growth rates among populations of species A in habitats S and I).

Develop a strategy for your Discussion

Many novice paper writers begin their Discussion section with a statement about problems with-their methods or the items in their results-about which they feel most insecure. Unless these really are the most important thing about your research (in whic h case you have problems), save them for later. Begin a Discussion with a short restatement of the most important points from your Results. Start with what you can say clearly based on what you did, not what you can't say or what you didn't do. Use this s tatement to set up the ideas you want to focus on in interpreting your results and relating them to the literature. Use sub-headings that structure the discussion around these ideas.

Introductions and conclusions are the hardest parts

Plan on spending a lot of time on them.-- Many technical writers prefer to write their introductions last because it is to difficult to craft that balance of general context and specific focus required for a good introduction. Often it is easier to ach ieve this after you have already worked through writing the entire paper or thesis. If you need to write the introduction

first to set the stage for your own thinking, resist the temptation to perfect it. By the time you have finished the rest of the pape r it will likely need substantial modification. The same concerns apply to conclusions, abstracts, and summaries. These components of the paper are all that many people will read, and you must get your message across in as direct, crisp, and enticing a ma nner as possible. Plan on taking your time and giving these components several more drafts than the rest of the paper.

Break up large projects into small pieces and work on the pieces

Don't write a thesis; write chapters or papers. Many thesis writers have a hard time starting to write because they are intimidated by the huge project looming ahead of them.

As a result, their first few months' efforts are often awkward and disjointed, as well as sparse. The thesis should be separated into small discrete sections, ideally distinct publishable papers. The overall organization of ideas should be done during the planning stage so that when you work on individual sections you can concentrate on them.

Don't wait until you think you've completed all your analyses to start writing. "Parallel processing" of writing one chapter while you complete the analyses for others and make presentation quality figures is a good strategy for avoiding writer's burn- out. Writing and analysis for any given chapter or paper is often an iterative process. Writing the results section of a paper is often the best way to discover the analyses and figures that still need to be done.

Make your writing flow and resonate

Probably the most frustrating and useful review I have received was from my masters advisor, Lee Gass, on a draft of a paper from my M.Sc. thesis. He said that all the key points were there and that the writing was clear, but it didn't "flow and resona te." He sent me back to rework it, and, eventually, the published product did "flow and resonate" (at least we thought so).

Once or twice a year I come across a paper that is written so well it is a

joy to read. If the content is as good as the writing, the experience of reading it can shape my thinking for some time thereafter. Papers written so well that they "flow and re sonate" are much more likely to influence your readers than the equivalent message presented in a form that is merely clear. When you find a paper that succeeds in this study carefully how the authors constructed their arguments and used language; try to identify what makes the paper work so well.

Use word processors effectively and back up your work religiously

Computers have improved tremendously the ease with which we can edit, shuffle, rewrite, and spell-check a paper. To do this efficiently requires investing time in learning about your tools. You needn't learn how to use all the more exotic features of y our word processor, but learn the options that are available and how to find out the details when you need them. Minimally, be familiar with basic requirements for document formatting (character and paragraph formatting, how to make lists with hanging ind ents, page organization, etc.) and basic operating system requirements (copying and saving files, doing directory searches). The same comments apply to the use of statistical packages, graphics programs, and spreadsheets: it is often possible to get the j ob done with little finesse in manipulating your software, but you will usually do a better job more efficiently after some investment in technical skills.

Almost everyone seems to require their own personal disaster to convince them of the need for backing up important files regularly. The frequency of "lost file" based excuses for late papers is remarkable. I save files to my hard drive frequently durin g working sessions and at the end of each session I make a back-up copy of any file that I would mind losing. The working memory of your computer is transitory and easily purged of its contents. Individual hard and floppy disks are little better as perman ent storage forms. Redundant copies dispersed in space and time are your main hope for avoiding disasters. When you have invested a lot in a writing project (such as a thesis that is nearing completion), keep at least one recent backup copy at home and on e at school at all times--in addition to your working copy on a hard drive. Keep sample hard copies of recent drafts until you complete the project.

Take editorial comments seriously

It may be clear from an editor's comments that they didn't understand the point you were making. If so, that is a clear indication that you need to improve your writing. Here is an example of my comments on an early draft of a thesis. These are among t he most frequent recommendations I make.

"This section offers enormous opportunities for improvement. The text is choppy, both at the sentence to-sentence level and the paragraphto-paragraph level. Many different points are mixed together in a sequence that often follows no logical flow.

You should:

- Create a list of the main points that you want to make here.
- Organize them in point form in a logical sequence in which one builds on what came previously. Then restructure your text so it follows this sequence.
- Write topic sentences that state the key issue for each point succinctly and without jargon.
- Flesh out each paragraph with a carefully constructed sequence of sentences that builds the argument you want to make.
- Make sure there is adequate conceptual 'glue' between paragraphs and major sections. Lead the reader along so there are no surprising jumps in subject. The reader should anticipate your next subject before you get there."

Acknowledgements

I would like to thank the many students who inspired and gave feedback on these notes. I hope their pleasure in good writing justifies the pain of getting there. Thanks also to Lee Gass for his continuing inspiration in the use of language and to J. M. Williams for writing a style book that is a model of clarity, grace, and common sense.

Literature cited

Hildebrand, M. 1983. Noun use criticism. Science t21:698.

Williams, J. M. 1990. Style: toward clarity and grace. University of Chicago Press, Chicago, Illinios, USA.

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Notes on the Structure of a Scientific Paper

A scientific paper is a written report describing original research results. The format of a scientific paper has been defined by centuries of developing tradition, editorial practice, scientific ethics and the interplay with printing and publishing services. A scientific paper should have, in proper order, a Title, Abstract, Introduction, Materials and Methods, Results, and Discussion.

Title

A title should be the fewest possible words that accurately describe the content of the paper. Omit all waste words such as "A study of ...", "Investigations of ...", "Observations on ...", etc. Indexing and abstracting services depend on the accuracy of the title, extracting from it keywords useful in cross-referencing and computer searching. An improperly titled paper may never reach the audience for which it was intended, so be specific. If the study is of a particular species, name it in the title. If the inferences made in the paper are limited to a particular region, then name the region in the title.

Keyword List

The keyword list provides the opportunity to add keywords, used by the indexing and abstracting services, *in addition* to those already present in the title. Judicious use of keywords may increase the ease with which interested parties can locate your article.

Abstract

A well prepared abstract should enable the reader to identify the basic content of a document quickly and accurately, to determine its relevance to their interests, and thus to decide whether to read the document in its entirety. The abstract should concisely state the principal objectives and scope of the investigation where these are not obvious from the title. More importantly, it should concisely summarize the results and principal conclusions. Do not include details of the methods employed unless the study is methodological, i.e. primarily concerned with methods.

The abstract must be concise, not exceeding 250 words. If you can convey the essential details of the paper in 100 words, do not use 200. Do not repeat information contained in the title. The abstract, together with the title, must be self-contained as it is published separately from the paper in abstracting services such as Biological Abstracts or Current Contents. Omit all references to the literature and to tables or figures, and omit obscure abbreviations and acronyms even though they may be defined in main body of the paper.

Introduction

The Introduction should begin by introducing the reader to the pertinent literature. A common mistake is to introduce authors and their areas of study in general terms without mention of their major findings. For example:

"Parmenter (1976) and Chessman (1978) studied the diet of *Chelodina longicollis* at various latitudes and Legler (1978) and Chessman (1983) conducted a similar study on *Chelodina expansa*"

compares poorly with:

"Within the confines of carnivory, *Chelodina expansa* is a selective and specialized predator feeding upon highly motile prey such as decapod crustaceans, aquatic bugs and small fish (Legler, 1978; Chessman, 1984), whereas *C. longicollis* is reported to have a diverse and opportunistic diet (Parmenter, 1976; Chessman, 1984)".

The latter is a far more informative lead-in to the literature, but more importantly it will enable the reader to clearly place the current work in the context of what is already known. An important function of the introduction is to establish the significance of the current work: Why was there a need to conduct the study?

Having introduced the pertinent literature and demonstrated the need for the current study, you should state clearly the scope and objectives. Avoid a series of point-wise statements -- use prose. A brief description of the region in which the study was conducted, and of the taxa in question, can be included at this point. The introduction can finish with the statement of objectives or, as some people prefer, with a brief statement of the principal findings. Either way, the reader must have an idea of where the paper is heading in order to follow the development of the evidence.

Materials and Methods

The main purpose of the Materials and Methods section is to provide enough detail for a competent worker to repeat your study and reproduce the results. The scientific method requires that your results be reproducible, and you must provide a basis for repetition of the study by others.

Often in field-based studies, there is a need to describe the study area in greater detail than is possible in the Introduction. Usually authors will describe the study region in general terms in the Introduction and then describe the study site and climate in detail in the Materials and Methods section. The sub-headings "Study Site", "General Methods" and "Analysis" may be useful, in that order.

Equipment and materials available off the shelf should be described exactly (Licor underwater quantum sensor, Model LI 192SB) and sources of materials should be given if there is variation in quality among supplies. Modifications to equipment or equipment constructed specifically for the study should be carefully described in detail. The method used to prepare reagents, fixatives, and stains should be stated exactly, though often reference to standard recipes in other works will suffice.

The usual order of presentation of methods is chronological, however related methods may need to be described together and strict chronological order cannot always be followed. If your methods are new (unpublished), you must provide all of the detail required to repeat the methods. However, if a method has been previously published in a standard journal, only the name of the method and a literature reference need be given.

Be precise in describing measurements and include errors of

measurement. Ordinary statistical methods should be used without comment; advanced or unusual methods may require a literature citation.

Show your materials and methods section to a colleague. Ask if they would have difficulty in repeating your study.

Results

In the results section you present your findings. Present the data, digested and condensed, with important trends extracted and described. Because the results comprise the new knowledge that you are contributing to the world, it is important that your findings be clearly and simply stated.

The results should be short and sweet, without verbiage. Do not say

"It is clearly evident from Fig. 1 that bird species richness increased with habitat complexity".

Say instead

"Bird species richness increased with habitat complexity (Fig. 1)".

However, do not be too concise. The readers cannot be expected to extract important trends from the data unaided. Few will bother. Combine the use of text, tables and figures to condense data and highlight trends. In doing so be sure to refer to the guidelines for preparing tables and figures below.

Discussion

In the discussion you should discuss the results. What biological principles have been established or reinforced? What generalizations can be drawn? How do your findings compare to the findings of others or to expectations based on previous work? Are there any theoretical/practical implications of your work? When you address these questions, it is crucial that your discussion rests firmly on the evidence presented in the results section. Continually refer to your results (but do not repeat them). Most importantly, do not extend your conclusions beyond those which are directly supported by your results. Speculation has its place, but should not form the bulk of the discussion. Be sure to address the objectives of the study in the discussion and to discuss the significance of the results. Don't leave the reader thinking "So what?". End the discussion with a short summary or conclusion regarding the significance

of the work.

References

Whenever you draw upon information contained in another paper, you must acknowledge the source. All references to the literature must be followed immediately by an indication of the source of the information that is referenced. For assignments in the Faculty of Applied Science, we expect you to use the Harvard system, for example:

"A drop in dissolved oxygen under similar conditions has been demonstrated before (Norris, l986)."

"Williams (1921) was the first to report this phenomenon."

". . . . . as discussed in detail by Ramsay (1983)."

If two authors are involved, include both surnames,

"The dune lakes of Jervis Bay are not perched in the generally accepted sense (Smith and Jones l964).",

however if more than two authors are involved, you are encouraged to make use of the *et al.* convention. It is an abbreviation of Latin meaning "and others".

"The significance of changes in egg contents during development is poorly understood (Webb *et al.*, 1986)."

"Williams *et al.* (1921) were the first to report this phenomenon."

Do not use the *et al.* abbreviation in the reference list at the end of the paper.

If two or more articles written by the same author in the same year are cited, then distinguish between them using the suffixes a, b, c etc in both the text and the reference list (e.g. Smith and Jones, 1982b).

If you include in your report, phrases, sentences or paragraphs lifted verbatim from the literature, it is not sufficient to simply cite the source. You must include the material in quotes and you must give the number of the page from which the quote was lifted. For example:

"Day (l979:3l) reports a result where "33.3% of the mice used in this experiment were cured by the test drug; 33.3% of the test population were unaffected by the drug and remained in a moribund condition; the third mouse got away".

A list of references ordered alphabetically on author's surname, must be provided at the end of your paper. The reference list should contain all references cited in the text but no more. Include with each reference details of the author, year of publication, title of article, name of journal or book, volume and page numbers. Formats vary from journal to journal, so when you are preparing a scientific paper for an assignment, choose a journal in your field of interest and follow its format for the reference list. Be consistent in the use of journal abbreviations.

Appendices

Appendices contain information in greater detail than can be presented in the main body of the paper, but which may be of interest to a few people working specifically in your field. Detailed ANOVA tables for example may be relegated to an appendix. Only appendices referred to in the text should be included.

Miscellaneous Formatting Conventions

The manuscript should be typed with double spacing throughout and a 3 cm left margin and 2 cm margins to the right top and bottom, to enable detailed comments by the examiner (or reviewers and editors). To assist the typesetter, indent paragraphs and do not hyphenate words at the right margin. A ragged right margin with no superfluous spaces between words may also be preferred by typesetters.

When Constructing Tables

☐ DO include a caption and column headings that contain enough information for the reader to understand the table without reference to the text. The caption should be at the head of the table.

☐ DO organize the table so that like elements read down, not across.

☐ DO present the data in a table or in the text, but never present the same data in both forms.

☐ DO choose units of measurement so as to avoid the use of an excessive number of digits.

☐ DON'T include tables that are not referred to in the text.

☐ DON'T be tempted to "dress up" your report by presenting data in the form of tables or figures that could easily be replaced by a sentence or two of text. Whenever a table or columns within a table can be readily put into words, do it.

☐ DON'T include columns of data that contain the same value throughout. If the value is important to the table include it in the caption or as a footnote to the table.

☐ DON'T use vertical lines to separate columns unless absolutely necessary.

When Constructing Figures

☐ DO include a legend describing the figure. It should be succinct yet provide sufficient information for the reader to interpret the figure without reference to the text. The legend should be below the figure.

☐ DO provide each axis with a brief but informative title (including units of measurement).

☐ DON'T include figures that are not referred to in the text, usually in the text of the results section.

☐ DON'T be tempted to "dress up" your report by presenting data in the form of figures that could easily be replaced by a sentence or two of text.

☐ DON'T fill the entire A4 page with the graph leaving little room for axis numeration, axis titles and the caption. The entire figure should lie within reasonable margins (say 3 cm margin on the left side, 2 cm margins on the top, bottom and right side of the page).

☐ DON'T extend the axes very far beyond the range of the data. For example, if the data range between 0 and 78, the axis should extend no further than a value of 80.

☐ DON'T use colour, unless absolutely necessary. It is very expensive, and the costs are usually passed on to the author. Colour in figures may look good in an assignment or thesis, but it means redrawing in preparation for publication.

Source

These guidelines were prepared with the aid of Robert Day's entertaining book "How to Write and Publish a Scientific Paper" (ISI Press, Philadelphia, l979). It would be a valuable addition to your library.

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Guidelines for Responsible Practice in Research and Dealing with Problems of Research Misconduct [Note 1]

Approved by Council at Meeting No. 56 [see Minutes] on 10 November 1997, replacing the ***Guidelines*** approved in 1994. Council approved an amendment to section 3.2.2 at Council Meeting No. 59.

A copy of this document in Rich Text Format may be downloaded to your computer by clicking on **DOWNLOAD**

Contents

Preamble

The broad principles that guide research have been long established. The maintenance of high ethical standards governing the collection and reporting of data are central to these principles. The responsibility of the research community to the public and to itself is widely acknowledged.

It is a basic assumption of institutions conducting research that their staff members are committed to high standards of professional conduct. Research workers have a duty to ensure that their work

enhances the good name of the institution and the profession to which they belong.

Research workers should only participate in work which conforms to accepted ethical standards and which they are competent to perform. When in doubt they should seek assistance with their research from their colleagues or peers. Debate on, and criticism of, research work are essential parts of the research process.

Institutions and research workers have a responsibility to ensure the safety of all those associated with the research. It is also essential that administrative support structures and the design of projects take account of any relevant ethical guidelines.

Communication between collaborators, maintenance and reference to records, presentation and discussion of work at scholarly meetings, publication of results, including the important element of peer refereeing, and the possibility that investigations will be repeated or extended by other researchers, all contribute to the intrinsically self-correcting nature of research.

If data of a confidential nature are obtained, for example from individual patient records or certain questionnaires, confidentiality must be observed and research workers must not use such information for their own personal advantage or that of a third party. In general, however, research results and methods should be open to scrutiny by colleagues within the institution and, through appropriate publication, by the profession at large. Secrecy may be necessary for a limited period in the case of contract research or of non-contractual research which is under consideration for patent protection.

Competition in research can have a strong and positive influence, enhancing the quality and immediacy of the work produced. However, competitive pressures can act to distort sound research practice. Rarely, and in extreme cases, the pressures of competition in research may tempt some researchers to "stretch the truth", to falsify data, to manipulate data in unrevealed ways inconsistent with routine practice, to plagiarise the work of others, to fail to give credit to others involved in the research where credit is due, or to pressure researchers junior to themselves to grant authorship on papers to which they have contributed marginally. Such practices are contemptible ethically, but they also may waste research effort and scarce research dollars through misdirected research caused by fabricated results, in the disillusionment of young researchers, and in loss of respect for the academic professions. Accordingly, tertiary institutions should set up codes of conduct as a framework for sound research practice. Indeed, this is now required by some granting bodies, such as the NH&MRC.

Such codes of practice need to strike a balance between legislating unnecessarily against a problem that does not yet exist in an institution, and safeguarding the institution against possible problems by establishing firm and understandable guidelines. Such a code also needs to strike a balance between bringing action against a staff member where it is warranted, and protecting staff from unsubstantiated accusation.

These guidelines aim to ensure a research environment that minimises the incidence of misconduct in research, by clearly outlining the responsibilities of researchers to maintain the highest ethical standards. The guidelines also provide procedures for dealing with allegations of misconduct in advance of a complaint. Adoption of fair and equitable procedures for dealing with complaints, that ensure fair dealing with both accused and complainant, is necessary to minimise the risk of the institution being involved in legal proceedings.

This document is in two parts. Part I sets out a *Code of Conduct for the Responsible Practice of Research*, consistent with the minimum standards outlined in the *Joint NHMRC/AVCC Statement and Guidelines on Research Practice* (May 1997). Part II outlines the procedures which should be used to deal with any allegations of misconduct in research.

Part I
Code of conduct for the responsible practice of research

1. General Principles

1.1 The University is required to establish procedures and guidelines on good research practice, and on steps to be followed if suspicions or allegations exist regarding research misconduct. This document meets that requirement. The University acknowledges its responsibility to make this document widely available to its research community.

1.2 The University has established and maintains practices and policies, outlined in its research plan, which promote the highest possible standards and discourage misconduct and fraud. These policies encourage the open presentation and discussion of results via peer review mechanisms.

1.3 The University has policies on the maintenance of records, retention of data, publications

and authorship, management of intellectual property, research training (where appropriate), confidentiality and conflict of interest. These policies are articulated in this document, in the University Research Plan and the policy documents listed therein, and in the Research Management Plans of the various faculties.

1.4

The University expects its researchers to meet their obligations to achieve and maintain the highest standards of intellectual honesty in the conduct of their research.

1.5

Researchers of the University must be aware of and adhere to ethical principles of justice and veracity, and of respect for people and their privacy and avoidance of harm to them, as well as respect for non-human subjects of research. Research must comply with guidelines established by the University for the use and care of animals and for human experimentation.

1.6

Where research procedures are of a kind requiring approval by a human or animal experimentation ethics committee, or by other safety or validly constituted regulatory committees, research must not proceed without such approval. Such committees have an obligation to meet with sufficient regularity and to deal with applications expeditiously, so as not to place undue pressure on researchers to meet the obligations to their research and the human or animal experimentation committees.

1.7

Persons responsible for monitoring the observance of these guidelines are outlined in Part II.

2. Specific Ethical Considerations

2.1

Retention of data

Sound research procedures entail the discussion of data and research methods with colleagues. Data related to publications must be available for discussion with other researchers. Discussion may also occur well after the research is complete, often because of interest following publication. The data may need to be available in the event of a dispute, from a source relatively independent of the adversaries in the dispute.

It is the responsibility of the individual researcher, and the faculty, school or research centre in which the data were generated, to ensure that data are recorded in a durable and appropriately referenced form, for a period of no less than 5 years. In the case of clinical data, 15 years may be more appropriate.

Individual researchers should be able to hold copies of the data for their own use. However, researchers are strongly advised that retention of data solely by the individual who conducted the research provides little protection to the individual or the institution in the event of an allegation of falsification of data.

Confidentiality agreements negotiated between the University and an external body to protect intellectual property rights may be agreed between the institution, the researcher

and a sponsor of the research. Where such agreements limit free publication and discussion, limitations and restrictions must be explicitly agreed.
It is the obligation of the researcher to enquire whether confidentiality agreements apply and of the Dean to inform researchers of their obligations with respect to these provisions. All confidentiality agreements should be made known at an early stage to the head of the research institution, or nominated representative.
The procedures formulated by institutions must include guidelines on the establishment and ownership of and access to data bases containing confidential information, and any limits on this.
When the data are obtained from limited access data-bases, or via a contractual arrangement, written indication of the location of the original data, or key information regarding the data-base from which it was collected, must be retained by the researcher or research unit.
Researchers must be responsible for ensuring appropriate security for any confidential material, including that held in computing systems. Where computing systems are accessible through networks, particular attention to security of confidential data is required. Security and confidentiality must be assured in a way that copes with multiple researchers and the departure of individual researchers.

2.2

Publication and authorship
It is essential that all parties responsible for bringing about a piece of research are duly acknowledged for their contribution in any publications or reports to emanate from the research. This is particularly important for senior staff, who have a responsibility to foster a positive environment for junior research staff by sharing the credit for joint research achievement. Authorship of a research output is a matter that should be discussed between researchers at an early stage in a research project, and reviewed whenever there are changes in participation.
When there is more than one co-author of a research output, one co-author (by agreement amongst the authors) should be nominated as executive author for the whole research output, and should take responsibility for record-keeping regarding the research output.
The minimum requirement for authorship of a publication should be a) participation in the conception and design, or analysis and interpretation of data; and b) participation in drafting the article or revising it critically for important intellectual content; and c) willingness to give final approval of the version to be published. "Honorary authorship" occurs when a person is listed as an author of a publication when they have not participated in any substantial way in the conception, execution or interpretation of at least part of the work described in the publication. "Honorary authorship" is unacceptable. Participation solely in the acquisition of funding or the collection of data does not justify authorship. General supervision of the research group is not sufficient for authorship. Any part of an article critical to its main conclusion must be the responsibility of at least one author. An author's role in a research output must be sufficient for that person to take public responsibility for at least that part of the output in that person's area of expertise.

No person who is an author, consistent with this definition, must be excluded as a author without their permission in writing.

Due recognition of all participants is a part of a proper research process. Authors must ensure that the work of all participants in the research -- research students/trainees, research assistants and technical officers, whether paid or voluntary – is properly acknowledged. Courtesy demands that individuals and organisations providing facilities should also be acknowledged.

It is the responsibility of the executive author (that is, the author taking overall responsibility for the publication) to ensure that all nominated authors each have read the final paper, that each meets the minimum requirements for authorship, and that there are no other persons who meet the minimum requirements for authorship but have not been included among the authors. In submitting the manuscript for publication, a statement to this effect should be included in the covering letter, and a copy of this letter, signed by all authors, should be held on file. The executive author should be identified in the letter as the author to which correspondence should be directed. If, for any reason, one or more co-authors are unavailable or otherwise unable to sign the statement of authorship, the Dean, Head of School, or Director of Research Centre may sign the file copy on their behalf, provided they themselves are not a co-author, noting the reason for the co-author's unavailability.

Conflicts arising through disputes about authorship should be first brought to the attention of the Head of School for resolution. If this fails, or if the Head of School is a party to the dispute, the matter should be brought before the Dean of the faculty.

Publication of multiple papers based on the same analysis of the same set(s) or subset(s) of data is not acceptable. Publication of multiple papers based on the same set(s) or subset (s) of data is acceptable, but only where new interpretations are presented and there is full cross-referencing within the papers (for example, in a series of closely related work, or where a complete work grew out of a preliminary publication and this is fully acknowledged). In borderline cases, an author who submits substantially similar work to more than one publisher must disclose this to the publishers at the time of submission.

As a general principle research findings should not be reported in the public media before they have been reported to a research audience of experts in the field of research, preferably by publication in a peer-reviewed journal, except where there is a contractual arrangement.

It is acknowledged that where issues of public policy and concern make prior advice desirable, such advice must be tendered first to the public or professional authorities responsible, and the unreported status of the findings must be advised at the same time. Only where responsible authorities fail to act can prior reporting to the media be justified, and again the unpublished status of the findings must be reported at the same time.

Where there is private reporting of research that has not yet been exposed to open peer-review scrutiny, especially when it is reported to prospective financial supporters, researchers have an obligation to explain fully the status of the work and the peer-review mechanisms to which it will be subjected.

Publications must include information on the sources of financial support for the research.

Financial sponsorship that carries an embargo on such naming of a sponsor should be avoided.

Deliberate inclusion of inaccurate or misleading information relating to research activity in curriculum vitae, grant applications, job applications or public statements, or the failure to provide relevant information, is a form of research misconduct. Accuracy is essential in describing the state of publication (in preparation, submitted, accepted), research funding (applied for, granted, funding period), and awards conferred, and where any of these relate to more than one researcher.

All reasonable steps must be taken to ensure that published reports, statistics and public statements about research activities and performance are complete, accurate and unambiguous.

2.3

The role of research supervisors

Supervision of each research student/trainee (including honours, masters and doctoral students, and junior postdoctoral staff) should be assigned to a specific, responsible and appropriately qualified senior research worker.

The responsibility for implementing this resides with the Faculty Higher Degree Committees or, in the case of doctoral candidates, with the University Higher Degrees and Scholarships Committee.

The ratio of research students/trainees to supervisors should be small enough to ensure effective interaction, as well as effective supervision of the research at all stages. Normally, at the University of Canberra, full time academic staff member would be expected to supervise no more than 5 EFTSU (Effective Full Time Student Units). This limit should be adopted as faculty policy by the Faculty Higher Degrees Committees.

Research supervisors must provide written material to each research student/trainee on applicable government and institutional guidelines for the conduct of research, including those covering ethical requirements for studies on human or animal subjects, and requirements for the use of potentially hazardous agents.

Research supervisors should be the primary source of guidance to research students/ trainees in all matters of sound research practice.

As far as possible, research supervisors should ensure that the work submitted by research students/trainees is their own and that, where there are data, that they are valid. For more detailed guidelines, refer to the University's Guidelines for Supervision of Research Students [as set out in the document Higher Degrees by Research - Policy and Procedures].

The head of the research unit should be personally involved in active research supervision and observe the research activities of those for whom he or she is responsible.

Professional relationships should be encouraged at all times. In particular, there should be wide discussion of the work of all individuals by their peers.

2.4

Disclosure of potential conflict of interest

Disclosure of any potential conflict of interest is essential for the responsible conduct of

research.
Conflicts of interest of all participants or proposed participants in research must be disclosed at the time of seeking permission from the University to apply for research funding.
Such disclosure should include a research worker's affiliation with, or financial involvement in, any organisation or entity with a direct interest in the subject matter of the research, or in the provision of materials for the research. These disclosures must cover the full range of interests including benefits in kind such as the provision of materials or facilities for the research, and the support of individuals through the provision of benefits (for example, travel and accommodation expenses to attend conferences). They should cover such interests to the persons responsible for institutional research management, to the editors of Journals to which papers are submitted (some editors already require this) and to bodies from which funds are sought.

Part II - Procedures for dealing with allegations of misconduct in research

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1. Introduction

   This Code of Conduct for the Responsible Practice in Research aims to ensure a research environment that minimises the incidence of misconduct in research. It is inevitable, however, that there will be some allegations of misconduct. It is essential that procedures for dealing with such allegations should be in place before the event. Failure to do this may result in the procedures failing or in the institution being involved in legal proceedings.
   These procedures cover allegations against staff members. Allegations against research students/trainees are covered by other university disciplinary procedures.

2. Definition of Misconduct in Research

   Misconduct in research includes:

   - The fabrication of data claiming results where none has been obtained.
   - The falsification of data including changing records.
   - Plagiarism, including the direct copying of textual material, the use of other people's data without acknowledgment and the use of ideas from other people without adequate attribution.
   - Misleading ascription of authorship including the listing of authors without their permission, attributing work to others who have not in fact contributed to the research, and the lack of appropriate acknowledgment of work primarily produced by a research student/trainee or associate.
   - Other practices that seriously deviate from those commonly accepted within the research community for proposing, conducting or reporting research.
   - Intentional infringements of the institution's published Code of Conduct for the Responsible Conduct of Research.

   Misconduct does not include honest errors or honest differences in interpretation or judgments of data.
   Examples of research misconduct include but are not limited to the following :

   Misappropriation: A researcher or reviewer shall not intentionally or recklessly

   a. plagiarize, which shall be understood to mean the presentation of the documented words or ideas of another as his or her own, without attribution

appropriate for the medium of presentation;

b. make use of any information in breach of any duty of confidentiality associated with the review of any manuscript or grant application;
c. intentionally omit reference to the relevant published work of others for the purpose of inferring personal discovery of new information.

Interference: A researcher or reviewer shall not intentionally and without authorization take or sequester or materially damage any research-related property of another, including without limitation the apparatus, reagents, biological materials, writings, data, hardware, software, or any other substance or device used or produced in the conduct of research.

Misrepresentation: A researcher or reviewer shall not with intent to deceive, or in reckless disregard for the truth,

a. state or present a material or significant falsehood; or
b. omit a fact so that what is stated or presented as a whole states or presents a material or significant falsehood.

The list above is not meant to be all inclusive. There may be other serious misdemeanours. For example, in human or animal experimentation, departing from approved protocols accepted by a specific discipline might constitute serious misconduct.

3. Procedures

3.1

Protection of interested parties
Allegations of research misconduct require very careful handling. When an allegation is made, the protection of all interested parties is essential.
Interested parties may include:

- The person bringing the allegation;
- The staff member against whom a complaint is made;
- Research students/trainees and staff working with the staff member concerned;
- Journals in which allegedly fraudulent papers have been or are about to be published;
- Funding bodies which have contributed to the research;
- In some cases the public - for example if a drug is involved.

Adequate protection of the complainant and the accused demands absolute confidentiality and reasonable speed in the early stages of investigation. On the other hand, the protection of other parties may involve some disclosure. Such

judgments should be made by the Vice-Chancellor.

3.2

Receipt of complaints

Allegations of misconduct in research may originate inside the institution, from other institutions, in learned journals or in the press. Allegations from outside the institution should be dealt with directly by the Vice-Chancellor.

Inside the institution, allegations may come from other members of staff or from research students/trainees. The latter may feel themselves to be in a difficult situation because their degree and their future career can depend on interaction with a supervisor.

3.2.1

Advisers on integrity in research

The Australian Vice-Chancellors' Committee (AVCC) recommends that institutions should nominate several persons who are familiar with the literature and guidelines on research misconduct to be advisers on integrity in research. Their task should be to give confidential advice to staff and students/trainees about what constitutes misconduct in research, the rights and responsibilities of a potential complainant, and the procedures for dealing with allegations of research misconduct within the institution. This function is the responsibility of the University Research Committee.

3.2.2

Designated people to receive formal complaints [amended by Council Meeting No. 59]

There should be a person designated to whom allegations are to be made. This person should be the Secretary of the University Research Committee who will receive written complaints and advise the Research Committee. It is important that the Vice-Chancellor should be informed immediately a complaint is received and be kept informed as the case progresses.

This function is the responsibility of the University Research Committee, which may, as the need arises, form a subcommittee to deal with complaints.

This subcommittee will be required to consider the material provided by the complainant and to decide whether the allegation should be dismissed or investigated further. If a preliminary investigation is to proceed, it must be authorised by the Vice-Chancellor.

3.3

The preliminary investigation

An investigation should not proceed unless there is a complainant, though their identity may remain confidential. Those charged with the responsibility for or a role in initiating or conducting an investigation of misconduct may not lodge a complaint leading to a preliminary investigation.

If there is the possibility of a charge of misconduct, the Vice-Chancellor must organise a preliminary investigation and then take action in accordance with the provisions of clause 9 of the Universities and Post Compulsory Academic Conditions Award 1995.

3.3.1

Action with staff member concerned

As good practice, if there is to be a preliminary investigation of the allegation, the staff member concerned should be informed in writing and given an opportunity to respond in writing. The name of the complainant should not be released.

The Vice-Chancellor may require the staff member to produce experimental data files or other material to be kept secure but not disclosed during the preliminary investigation.

3.3.2

Form of the investigation

The form of the preliminary investigation will depend on the case and must be decided by the Vice-Chancellor. The Vice-Chancellor must have the power to conduct the preliminary investigation in person if that is appropriate. In some cases, there will need to be a small committee from inside the institution but from areas not affected by the research in question. In other cases, it may be necessary to seek expert help from outside the institution.

The preliminary investigation should be conducted expeditiously and, as far as is possible, confidentiality should be maintained.

3.3.3

Action on completion of the preliminary investigation

3.3.3.1

No case exists:

If no case is found to exist, the staff member concerned should be informed that there will be no further action taken and the conclusion should be recorded on his or her file, as far as possible, in a form satisfactory to the staff member.

If it is considered that the complainant has brought charges improperly, the complainant should be disciplined. If the charges were reasonably brought but incorrect, the case should cease.

The Vice-Chancellor will need to exercise judgment at this point to determine whether there are individuals or organisations that need to be informed. This will depend on the degree of confidentiality that

has been achieved.

3.3.3.2

A case is seen to exist:
If the preliminary investigation finds cause for further investigation this should be commenced as soon as possible.
The first step is the provision of particulars to the staff member in writing. The staff member has thirty days to respond, also in writing.
If further investigation leads to the staff member being cleared of charges, the same considerations arise as if no case had existed requiring further investigation (see above).
If the staff member is in receipt of a grant from an external funding body, the Vice-Chancellor will advise the Secretary of that funding body, in confidence, that a case is being formally investigated on the understanding that the funding body will not terminate the grant until the outcome of the fraud investigation is known, although it may choose to suspend funds in the meantime.

3.4

The formal investigation

3.4.1

Award procedures
Formal procedures for dealing with misconduct are governed by the Universities and Post Compulsory Academic Conditions Award 1995.

3.4.2

Special requirements
There are other matters which need to be considered in setting up adequate procedures for dealing with a formal investigation into research fraud or misconduct.
The Award outlines the composition of the Committee that must be formed to deal with the formal investigation.
The Committee should have access to legal advice and to expert advice on the research subject. The institution should pay for this advice and ensure that the committee members are indemnified.
While confidentiality remains important during a formal investigation, other matters may take precedence.

- It is important to protect the accused. If the charges are dismissed, he or she will need to be reinstated with a clean record. A charge of misconduct could damage a person's future prospects and defamation action could result unless the procedures laid down are carefully

followed.

- It is important to protect the complainant. There is a possibility of victimisation which could seriously affect the complainant's career.
- There may in some circumstances be a reason to inform the publishers of a journal that the authenticity of a paper or papers is in doubt. A false paper may put elements of the community at risk.

It is not possible in advance to state what should happen. The adjudicating body in the formal investigation must determine what should be made public and when, bearing in mind the interests of all concerned.

If allegations are made which appear to cast doubt on the validity of one or more research publications produced by a staff member, it may be necessary to investigate the person's past research as well as that covered by the allegations.

If the claim of research misconduct has been substantiated, it is important that the position of research students/trainees and staff working with the accused be clarified. In some cases, if there has been misconduct, it may be necessary to provide compensation to innocent people who have been affected.

3.5

Action following the formal investigation

If a person is found guilty, the institution should take disciplinary action quickly. Relevant publishers and sponsoring agencies should be notified.

If a person is found to be innocent, action may be needed to redress any damage resulting from the allegation.

If an external funding body was advised of a formal investigation and the staff member has been exonerated, then the external funding body will be advised accordingly.

If the staff member has been found guilty and is in receipt of a current grant from an external funding body or in receipt of a grant from an external funding body when the misconduct occurred, or is currently an applicant for a grant from an external funding body, then the Vice-Chancellor must provide the Secretary of such funding bodies with a full written report of the formal investigation.

3.6

Action if the accused resigns

If a staff member charged with serious misconduct resigns, procedures should cease. The institution cannot take any further action against the staff member. This is a reasonable requirement to ensure fair treatment for the person concerned.

It is not necessarily satisfactory for an enquiry into research fraud or misconduct to be abandoned if a resignation is received. Almost always others will have been affected or will be affected, perhaps very seriously, unless the facts are determined. It should therefore be part of an institution's procedures that, in the event of resignation, an enquiry is convened to report on the status of the research and on any remedial action needed to protect affected people and the public. Those who

need to be considered are listed in Section 3.1 of these procedures.
In addition, external funding bodies that supported the research or the research worker must receive a report on the status of the research and on any remedial action recommended.

4. Acknowledgments These guidelines follow closely the *Joint NHMRC/AVCC Statement and Guidelines on Research Practice (May 1997)*. They build upon the University of Canberra's *Guidelines for Responsible Practice in Research and Dealing with Problems of Research Misconduct (June 1994)*

The Research Committee acknowledges the work of Associate Professor Arthur Georges in preparing this document.

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Last updated: Thursday, 23-Mar-00 17:34:33

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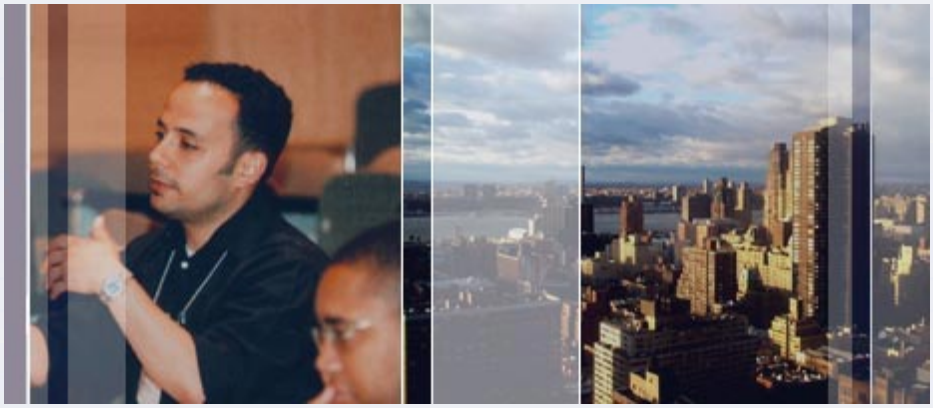

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The 12 Minute Talk

Structure

Organize your talk along the following lines:

- Tell the audience what your talk is about and where you aim to take them.
- Introduce the subject by posing the problem you are to address in the context of what is already known.
- Describe your approach and methods minimally -- if you can assume knowledge of the audience, assume it to be already given. This section may be longer if you are presenting a research proposal.
- Present the results, focussing on no more than three key ideas. Bring each idea to closure. This section may be shorter if you are presenting a research proposal.
- Discuss the implications of the results for management or the discipline of study.

Some good advice: A noted speaker was asked his secret of success. "First," he said, "you write an exciting opening that will draw the attention of everyone in the room. Then you compose a dramatic summary and closing words that will leave the audience spellbound. Then," he advised, "you put them as close together as possible."

Criteria for success

A talk will be considered successful if

- the talk does not exceed the allotted time of twelve minutes.

☐ the subject is well introduced with the scope set and the objectives clearly stated.

☐ the talk is focussed on no more than three major points with supporting data and argument.

☐ there is minimal information provided on materials and methods, unless the talk is methodological or a research proposal.

☐ the implications for the discipline of study or in application are clearly stated.

☐ the talk, and each of the sentinent ideas, are brought successfully to closure -- the audience is not left hanging or thinking "so what"?

☐ textual overheads/slides do not exceed 12 in number.

☐ overheads/slides are clearly legible from the rear of the room by the most myopic, and are free of unnecessary detail or excessive content.

☐ the talk is presented in a clear voice, audible from the back of the room and relatively free from, uh, vocal faults.

☐ the speaker is clearly enthused by his or her topic.

☐ questions are addressed without evasion and answers demonstrate deep understanding of the research topic and key issues that relate to it.

Errors of logic, though devastating in extreme cases, are not to be considered faults of the presentation. Constructive criticism during or following a talk is to be welcomed. Indeed it should be actively encouraged by exposing the weak points of your research to criticism and suggestion.

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University of Canberra

Guidelines for Responsible Practice in Research and Dealing with Problems of Research Misconduct

Note: This document has been replaced by new **Guidelines**.

These *Guidelines for Responsible Practice in Research and Dealing with Problems of Research Misconduct* were approved by the University Council at its Meeting No. 32 on 25 May 1994.

Enquiries or comments concerning this document may be directed by e-mail to the Secretary of the Research Committee.

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Contents

Preamble

The broad principles that guide research have been long established. Central to these are the maintenance of high ethical standards governing the collection and reporting of data. The responsibility of the research community to the public and to itself is widely acknowledged.

Communication between collaborators, maintenance and reference to records, presentation and discussion of work at scholarly meetings, publication of results, including the important element of peer refereeing, and the possibility that investigations will be repeated or extended by other researchers, all contribute to the intrinsically self-correcting nature of research.

Competition in research can have a strong and positive influence. Enhancing the quality and immediacy of the work produced. However, competitive pressures can act to distort sound research practice. Rarely, and in extreme cases, the pressures of competition in research may tempt some researchers to "stretch the truth", to falsify data, to manipulate data in unrevealed ways inconsistent with routine practice, to plagiarise the work of others, to fail to give credit to others involved in the research where credit is due, or to pressure researchers junior to themselves to grant authorship on papers to which they have contributed marginally. Such practices are contemptible ethically, but they also may waste research effort and scarce research dollars through misdirected research caused by fabricated results, in the disillusionment of young researchers, and in loss of respect for the academic professions. Accordingly, tertiary institutions should set up codes of conduct as a framework for sound research practice. Indeed, this is now required by some granting bodies, such as the NH&MRC.

Such codes of practice need to strike a balance between legislating unnecessarily against a problem that does not yet exist in an institution, and safeguarding the institution against possible problems by establishing firm and understandable guidelines. Such a code also needs to strike a balance between bringing action against a staff member where it is warranted, and protecting staff from unsubstantiated accusation.

These guidelines aim to ensure a research environment that minimises the incidence of misconduct in research, by clearly outlining the responsibilities of researchers to maintain the highest ethical standards. The guidelines also provide procedures for dealing with allegations of misconduct in advance of a complaint. Adoption of fair and equitable procedures for dealing with complaints, that ensure fair dealing with both accused and complainant, is necessary to minimise the risk of the institution being involved in legal proceedings.

This document is in two parts. **Part I** sets out a Code of Conduct for the Responsible Practice of Research. **Part II** outlines the procedures which should be used to deal with any allegations of

misconduct in research.

Part I

Code of conduct for the responsible practice of research

1. General Ethical Considerations It is a basic assumption of institutions conducting research that their staff members are committed to high standards of professional conduct. Research workers have a duty to ensure that their work enhances the good name of the institution and the profession to which they belong.

   Research workers should only participate in work which conforms to accepted ethical standards and which they are competent to perform. When in doubt they should seek assistance with their research from their colleagues or peers. Debate on, and criticism of, research work are essential parts of the research process.

   Institutions and research workers have a responsibility to ensure the safety of all those associated with the research. It is also essential that the design of projects takes account of any relevant ethical guidelines.

   If data of a confidential nature are obtained, for example from individual patient records or certain questionnaires, confidentiality must be observed and research workers must not use such information for their own personal advantage or that of a third party. In general, however, research results and methods should be open to scrutiny by colleagues within the institution and, through appropriate publication, by the profession at large.

   Secrecy may be necessary for a limited period in the case of contract research.

2. Specific Ethical Considerations

   ### 2.1 Retention of data

   Sound research procedures entail the discussion of data and research methods with colleagues. Discussion may also occur well after the research is complete, often because of interest following publication. The data may need to be available in the event of a dispute, from a source relatively independent of the adversaries in the dispute.

   It is the responsibility of the individual researcher, and the faculty, school or research centre in which the data were generated, to ensure that data are recorded in a durable and appropriately referenced form, for a period of no less than 5 years.

It is acknowledged that data obtained from limited access databases or in a contract project may not be able to be retained. In such cases, a written indication of the location of the original data or key information regarding the limited access database from which it was extracted must be kept in the department or research unit.

While individual researchers should be able to hold copies of the data for their own use, they are advised that retention of data solely by the individual research worker provides little protection to the research worker or the institution in the event of an allegation of falsification of data.

2.2 Publication and authorship

It is essential that all parties responsible for bringing about a piece of research are duly acknowledged for their contribution in any publications or reports to emanate from the research. This is particularly important for senior staff, who have a responsibility to foster a positive environment for junior research staff by sharing the credit for joint research achievement.

Where there is more than one author of a publication, one author (by agreement among the authors) should formally accept overall responsibility for the entire publication.

The minimum requirement for authorship of a publication should be participation in conceiving, executing or interpreting at least part of the research reported. "Honorary authorship" occurs when a person is listed as an author of a publication when they have not participated in any substantial way in the conception, execution or interpretation of at least part of the work described in the publication. "Honorary authorship" is unacceptable.

Due recognition of all participants is a part of a proper research process. Authors must ensure that the work of all participants in the research - research students/trainees, research assistants and technical officers, whether paid or voluntary - is properly acknowledged.

It is the responsibility of the senior author, or the author taking overall responsibility for the publication, to ensure that all nominated authors each have read the final paper, that each meets the minimum requirements for authorship and that there are no other persons who meet the minimum requirements for authorship but have not been included among the authors.

Publication of multiple papers based on the same set(s) or sub-set(s) of data is improper unless there is full cross-referencing (for example, by reference to a preliminary publication at the time of publication of the complete work which grew from it). Simultaneous submission to more than one journal or publisher of material based on the same set(s) or .sub-set(s) of data should be disclosed at the time of submission.

2.3 The role of research supervisors

Supervision of each research student/trainee (including honours, masters and doctoral students, and junior postdoctoral staff) should be assigned to a specific, responsible and appropriately qualified senior research worker.

The responsibility for implementing this resides with the Faculty Higher Degree Committees or, in the case of PhD candidates, with the University Higher Degrees and Scholarships Committee.

The ratio of research students/trainees to supervisors should be small enough to ensure effective interaction, as well as effective supervision of the research at all stages.

Normally, at the University of Canberra, full time academic staff member would be expected to supervise no more than 5 EFTSU (Effective Full Time Student Units). This limit should be adopted as faculty policy by the Faculty Higher Degrees Committees.

Research supervisors must advise each research student/trainee of applicable government and institutional guidelines for the conduct of research, including those covering ethical requirements for studies on human or animal subjects, and requirements for the use of potentially hazardous agents.

Research supervisors should be the primary source of guidance to research students/trainees in all matters of sound research practice.

As far as possible, research supervisors should ensure that the work submitted by research students/trainees is their own and that, where there are data, that they are valid. For more detailed guidelines, refer to the University's Guidelines for Supervision of Research Students.

The head of the research unit should be personally involved in active research supervision and observe the research activities of those for whom he or she is responsible. Professional relationships should be encouraged at all times. In particular, there should be wide discussion of the work of all individuals by their peers.

2.4 Disclosure of potential conflict of interest

Disclosure of any potential conflict of interest is essential for the responsible conduct of research.

Conflicts of interest of all participants or proposed participants in research must be disclosed at the time of seeking permission from the University to apply for research funding.

Such disclosure should include a research worker's affiliation with, or financial involvement in, any organisation or entity with a direct interest in the subject matter of the research, or in the provision of materials for the research. These disclosures must cover the full range of interests including benefits in kind such as the provision of materials or facilities for the research, and the

support of individuals through the provision of benefits (for example, travel and accommodation expenses to attend conferences). They should cover such interests to the persons responsible for institutional research management, to the editors of Journals to which papers are submitted (some editors already require this) and to bodies from which funds are sought.

3. Special needs in different disciplines In some disciplines there will be special areas which require regulation, for example, animal and human experimentation (including interviewing and surveying people) and the handling of hazardous materials. The rules for these activities should form part of the general code of ethics for each discipline. For further information, refer to the guidelines governing the University Human Ethics Committee and the Animal Ethics Committee.

Part II

Procedures for dealing with allegations of misconduct in research

1. Introduction This Code of Conduct for the Responsible Practice of Research aims to ensure a research environment that minimises the incidence of misconduct in research. It is inevitable, however, that there will be some allegations of misconduct. It is essential that procedures for dealing with such allegations should be in place before the event. Failure to do this may result in the procedures failing or in the institution being involved in legal proceedings.

   These procedures cover allegations against staff members. Allegations against research students/ trainees are covered by other university disciplinary procedures.

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   - Intentional infringements of the institution's published Code of Conduct for the Responsible Conduct of Research.

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- The staff member against whom a complaint is made.
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- Journals in which allegedly fraudulent papers have been or are about to be published.
- Funding bodies which have contributed to the research.
- In some cases the public - for example if a drug is involved.

Adequate protection of the complainant and the accused demands absolute confidentiality and reasonable speed in the early stages of investigation. On the other hand, the protection of other parties may involve some disclosure. Such judgments should be made by the Vice-Chancellor.

3.2 Receipt of complaints

Allegations of misconduct in research may originate inside the institution, from other institutions, in learned journals or in the press. Allegations from outside the institution should be dealt with directly by the Vice-Chancellor.

Inside the institution, allegations may come from other members of staff or from research students/trainees. The latter may feel themselves to be in a difficult situation because their degree and their future career can depend on interaction with a supervisor.

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The Australian Vice-Chancellors' Committee (AVCC) recommends that institutions should nominate several persons who are familiar with the literature and guidelines on research misconduct to be advisers on integrity in research. Their task should be to give confidential advice to staff and students/trainees about what constitutes misconduct in research, the rights and

responsibilities of a potential complainant, and the procedures for dealing with allegations of research misconduct within the institution. This function is the responsibility of the University Research Committee.

3.2.2 Designated people to receive formal complaints

There should be a small number of designated people to whom allegations are to be made. These should be senior academics experienced in research and preferably from different discipline areas and should be a mix of males and females. It is important that the Vice-Chancellor should be informed immediately a complaint is received and be kept informed as the case progresses.

This function is the responsibility of the University Research Committee, which may, as the need arises, form a subcommittee to deal with complaints.

This group will be required to consider the material provided by the complainant and to decide whether the allegation should be dismissed or investigated further. If a preliminary investigation is to proceed, it must be authorised by the Vice-Chancellor.

3.3 The preliminary investigation

An investigation should not proceed unless there is a complainant, though their identity may remain confidential. Those charged with the responsibility for or a role in initiating or conducting an investigation of misconduct may not lodge a complaint leading to a preliminary investigation.

If there is the possibility of a charge of misconduct, the Vice-Chancellor must organise a preliminary investigation and then take action in accordance with the provisions of clause 9 of the *Australian Universities Academic Staff (Conditions of Employment) Award 1988*.

3.3.1 Action with staff member concerned

As good practice, if there is to be a preliminary investigation of the allegation, the staff member concerned should be informed in writing and given an opportunity to respond in writing. The name of the complainant should not be released.

The Vice-Chancellor may require the staff member to produce experimental data files or other material to be kept secure but not disclosed during the preliminary investigation.

3.3.2 Form of the investigation

The form of the preliminary investigation will depend on the case and must be decided by the Vice-Chancellor. The Vice-Chancellor must have the power to conduct the preliminary investigation in person if that is appropriate. In some cases, there will need to be a small

committee from inside the institution but from areas not affected by the research in question. In other cases, it may be necessary to seek expert help from outside the institution.

The preliminary investigation should be conducted expeditiously and, as far as is possible, confidentiality should be maintained.

The preliminary investigation should be limited to determining whether a sufficient case exists, for formal charges of misconduct to be laid.

3.3.3 Action on completion of the preliminary investigation

3.3.3.1 No case exists:

If no case is found to exist, the staff member concerned should be informed that there will be no further action taken and the conclusion should be recorded on his or her file, as far as possible, in a form satisfactory to the staff member.

If it is considered that the complainant has brought charges improperly, the complainant should be disciplined. If the charges were reasonably brought but incorrect, the case should cease.

The Vice-Chancellor will need to exercise judgment at this point to determine whether there are individuals or organisations that need to be informed. This will depend on the degree of confidentiality that has been achieved.

3.3.3.2 A case is seen to exist:

If the preliminary investigation finds cause for further investigation this should be commenced as soon as possible.

The first step is the provision of particulars to the staff member in writing. The staff member has thirty days to respond, also in writing. If further investigation leads to the staff member being cleared of charges, the same considerations arise as if no case had existed requiring further investigation (see above).

If the staff member is in receipt of a grant from an external funding body, the Vice-Chancellor will advise the Secretary of that funding body, in confidence, that a case is being formally investigated on the understanding that the funding body will not terminate the grant until the outcome of the fraud investigation is known, although it may choose to suspend funds in the meantime.

3.4 The formal investigation

3.4.1 Award procedures

Formal procedures for dealing with misconduct are governed by clause 9 of the *Australian Universities Academic Staff (Conditions of Employment) Award 1988* (Appendix A). Subclauses 9 (e) to (q) set out the legal requirements.

3.4.2 Special requirements

There are other matters which need to be considered in setting up adequate procedures for dealing with a formal investigation into research fraud or misconduct.

Section 9(i) of the Award provides for a three person Committee including a nominee of the Vice-Chancellor, a nominee of the President of the local branch of the union and a senior member of the legal profession or a person with appropriate experience in industrial relations appointed by agreement between the Vice-Chancellor and the President.

The Committee should have access to legal advice and to expert advice on the research subject. The institution should pay for this advice and ensure that the committee members are indemnified.

While confidentiality remains important during a formal investigation, other matters may take precedence.

- It is important to protect the accused. If the charges are dismissed, he or she will need to be reinstated with a clean record. A charge of misconduct could damage a person's future prospects and defamation action could result unless the procedures laid down are carefully followed.
- It is important to protect the complainant. There is a possibility of victimisation which could seriously affect the complainant's career.
- There may in some circumstances be a reason to inform the publishers of a journal that the authenticity of a paper or papers is in doubt. A false paper may put elements of the community at risk.

It is not possible in advance to state what should happen. The adjudicating body in the formal investigation must determine what should be made public and when, bearing in mind the interests of all concerned.

If allegations are made which appear to cast doubt on the validity of one or more research publications produced by a staff member, it may be necessary to investigate the person's past research as well as that covered by the allegations.

If the claim of research misconduct has been substantiated, it is important that the position of research students/trainees and staff working with the accused be clarified. In some cases, if there

has been misconduct, it may be necessary to provide compensation to innocent people who have been affected.

3.5 Action following the formal investigation

If a person is found guilty, the institution should take disciplinary action quickly. Relevant publishers and sponsoring agencies should be notified.

If a person is found to be innocent, action may be needed to redress any damage resulting from the allegation.

If an external funding body was advised of a formal investigation and the staff member has been exonerated, then the external funding body will be advised accordingly.

If the staff member has been found guilty and is in receipt of a current grant from an external funding body or in receipt of a grant from an external funding body when the misconduct occurred, or is currently an applicant for a grant from an external funding body, then the Vice-Chancellor must provide the Secretary of such funding bodies with a full written report of the formal investigation.

3.6 Action if the accused resigns

Subclause 9(q) of the Award states that if a staff member charged with serious misconduct resigns, procedures should cease. The institution cannot take any further action against the staff member. This is a reasonable requirement to ensure fair treatment for the person concerned.

It is not necessarily satisfactory for an enquiry into research fraud or misconduct to be abandoned if a resignation is received. Almost always others will have been affected or will be affected, perhaps very seriously, unless the facts are determined. It should therefore be part of an institution's procedures that, in the event of resignation, an enquiry is convened to report on the status of the research and on any remedial action needed to protect affected people and the public. Those who need to be considered are listed in Section 3.1 of these procedures.

In addition, external funding bodies that supported the research or the research worker must receive a report on the status of the research and on any remedial action recommended.

4. Acknowledgments These guidelines follow closely the *Guidelines for Responsible Practice in Research and Dealing with Problems of Research Misconduct* circulated by the AVCC in November of l990. In preparing its document, the AVCC acknowledged the assistance of the **National Health and Medical Research Council** in the drafting of some clauses.

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Make definite assertions. Avoid tame, colorless, hesitating, non-committal language.—Rule 12

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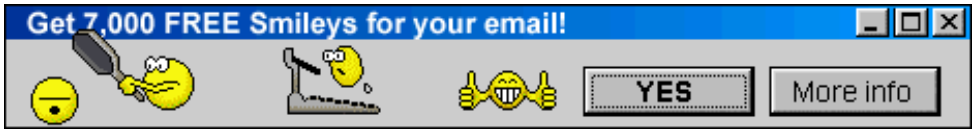

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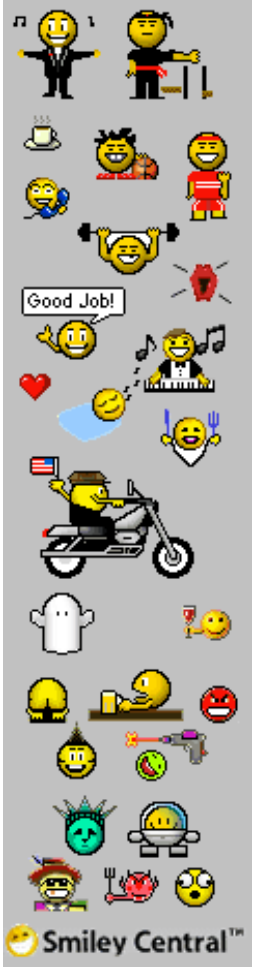

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William Strunk, Jr. (1869–1946). The Elements of Style. 1918.

II. Elementary Rules of Usage

1. **Form the possessive singular of nouns with 's.**

   Follow this rule whatever the final consonant. Thus write,

Charles's friend
Burns's poems
the witch's malice

   This is the usage of the United States Government Printing Office and of the Oxford University Press.

   Exceptions are the possessives of ancient proper names in *-es* and *-is*, the possessive *Jesus'*, and such forms as *for conscience' sake, for righteousness' sake.* But such forms as *Achilles' heel, Moses' laws, Isis' temple* are commonly replaced by

the heel of Achilles
the laws of Moses
the temple of Isis

   The pronominal possessives *hers, its, theirs, yours,* and *oneself* have no apostrophe.

2. **In a series of three or more terms with a single conjunction, use a comma after each term except the last.**

   Thus write,

red, white, and blue
honest, energetic, but headstrong
He opened the letter, read it, and made a note of its contents.

This is also the usage of the Government Printing Office and of the Oxford University Press.

In the names of business firms the last comma is omitted, as

Brown, Shipley and Company

The abbreviation *etc.*, even if only a single term comes before it, is always preceded by a comma.

3. **Enclose parenthetic expressions between commas.**

The best way to see a country, unless you are pressed for time, is to travel on foot.

This rule is difficult to apply; it is frequently hard to decide whether a single word, such as *however*, or a brief phrase, is or is not parenthetic. If the interruption to the flow of the sentence is but slight, the writer may safely omit the commas. But whether the interruption be slight or considerable, he must never omit one comma and leave the other. Such punctuation as

Marjorie's husband, Colonel Nelson paid us a visit yesterday,

or

My brother you will be pleased to hear, is now in perfect health,

is indefensible.

Non-restrictive relative clauses are, in accordance with this rule, set off by commas.

The audience, which had at first been indifferent, became more and more interested.

Similar clauses introduced by *where* and *when* are similarly punctuated.

In 1769, when Napoleon was born, Corsica had but recently been acquired by France.
Nether Stowey, where Coleridge wrote *The Rime of the Ancient Mariner*, is a few miles from Bridgewater.

In these sentences the clauses introduced by *which*, *when*, and *where* are non-restrictive; they do not limit the application of the words on which they depend, but add, parenthetically, statements supplementing those in the principal clauses. Each sentence is a combination of two statments which might have been made independently.

The audience was at first indifferent. Later it became more and more interested.
Napoleon was born in 1769. At that time Corsica had but recently been acquired by France.
Coleridge wrote *The Rime of the Ancient Mariner* at Nether Stowey. Nether Stowey is only a few miles from Bridgewater.

Restrictive relative clauses are not set off by commas.

The candidate who best meets these requirements will obtain the place.

In this sentence the relative clause restricts the application of the word *candidate* to a single person. Unlike those above, the sentence cannot be split into two independent statements.

The abbreviations *etc.* and *jr.* are always preceded by a comma, and except at the end of a sentence, followed by one.

Similar in principle to the enclosing of parenthetic expressions between commas is the setting off by commas of phrases or dependent clauses preceding or following the main clause of a sentence. The sentences quoted in this section and under Rules 4, 5, 6, 7, 16, and 18 should afford sufficient guidance.

If a parenthetic expression is preceded by a conjunction, place the first comma before the conjunction, not after it.

He saw us coming, and unaware that we had learned of his treachery, greeted us with a smile.

4. **Place a comma before *and* or *but* introducing an independent clause.**

The early records of the city have disappeared, and the story of its first years can no longer be reconstructed.
The situation is perilous, but there is still one chance of escape.

Sentences of this type, isolated from their context, may seem to be in need of rewriting. As they make complete sense when the comma is reached, the second clause has the appearance of an after-thought. Further, *and*, is the least specific of connectives. Used between independent clauses, it indicates only that a relation exists between them without defining that relation. In the example above, the relation is that of cause and result. The two sentences might be rewritten:

As the early records of the city have disappeared, the story of its first years can no longer be reconstructed.
Although the situation is perilous, there is still one chance of escape.

Or the subordinate clauses might be replaced by phrases:

Owing to the disappearance of the early records of the city, the story of its first years can no longer be reconstructed.
In this perilous situation, there is still one chance of escape.

But a writer may err by making his sentences too uniformly compact and periodic, and an occasional loose sentence prevents the style from becoming too formal and gives the reader a certain relief. Consequently, loose sentences of the type first quoted are common in easy, unstudied writing. But a writer should be careful not to construct too many of his sentences after this pattern (see Rule 14).

Two-part sentences of which the second member is introduced by *as* (in the sense of *because*), *for, or, nor*, and *while* (in the sense of *and at the same time*) likewise require a comma before the conjunction.

If a dependent clause, or an introductory phrase requiring to be set off by a comma, precedes the second independent clause, no comma is needed after the conjunction.

The situation is perilous, but if we are prepared to act promptly, there is still one chance of escape.

For two-part sentences connected by an adverb, see the next section.

5. **Do not join independent clauses by a comma.**

If two or more clauses, grammatically complete and not joined by a conjunction, are to form a single compound sentence, the proper mark of punctuation is a semicolon.

Stevenson's romances are entertaining; they are full of exciting adventures.
It is nearly half past five; we cannot reach town before dark.

It is of course equally correct to write the above as two sentences each, replacing the semicolons by periods.

Stevenson's romances are entertaining. They are full of exciting adventures.
It is nearly half past five. We cannot reach town before dark.

If a conjunction is inserted, the proper mark is a comma (Rule 4).

Stevenson's romances are entertaining, for they are full of exciting adventures.
It is nearly half past five, and we cannot reach town before dark.

Note that if the second clause is preceded by an adverb, such as *accordingly, besides, so, then, therefore,* or *thus,* and not by a conjunction, the semicolon is still required.

I had never been in the place before; so I had difficulty in finding my way about.

In general, however, it is best, in writing, to avoid using *so* in this manner; there is danger that the writer who uses it at all may use it too often. A simple correction, usually serviceable, is to omit the word *so,* and begin the first clause with *as:*

As I had never been in the place before, I had difficulty in finding my way about.

If the clauses are very short, and are alike in form, a comma is usually permissible:

Man proposes, God disposes.
The gate swung apart, the bridge fell, the portcullis was drawn up.

6. **Do not break sentences in two.**

In other words, do not use periods for commas.

I met them on a Cunard liner several years ago. Coming home from Liverpool to New York.
He was an interesting talker. A man who had traveled all over the world, and lived in half a dozen countries.

In both these examples, the first period should be replaced by a comma, and the following word begun with a small letter.

It is permissible to make an emphatic word or expression serve the purpose of a sentence and to punctuate it accordingly:

Again and again he called out. No reply.

The writer must, however, be certain that the emphasis is warranted, and that he will not be suspected of a mere blunder in punctuation.

Rules 3, 4, 5, and 6 cover the most important principles in the punctuation of ordinary sentences; they should be so thoroughly mastered that their application becomes second nature.

7. **A participial phrase at the beginning of a sentence must refer to the grammatical subject.**

> Walking slowly down the road, he saw a woman accompanied by two children.

The word *walking* refers to the subject of the sentence, not to the woman. If the writer wishes to make it refer to the woman, he must recast the sentence:

> He saw a woman, accompanied by two children, walking slowly down the road.

Participial phrases preceded by a conjunction or by a preposition, nouns in apposition, adjectives, and adjective phrases come under the same rule if they begin the sentence.

On arriving in Chicago, his friends met him at the station.	When he arrived (or, On his arrival) in Chicago, his friends met him at the station.
A soldier of proved valor, they entrusted him with the defence of the city.	A soldier of proved valor, he was entrusted with the defence of the city.
Young and inexperienced, the task seemed easy to me.	Young and inexperienced, I thought the task easy.
Without a friend to counsel him, the temptation proved irresistible.	Without a friend to counsel him, he found the temptation irresistible.

Sentences violating this rule are often ludicrous.

> Being in a dilapidated condition, I was able to buy the house very cheap.

8. **Divide words at line-ends, in accordance with their formation and pronunciation.**

If there is room at the end of a line for one or more syllables of a word, but not for the whole word, divide the word, unless this involves cutting off only a single letter, or cutting off only two letters of a long word. No hard and fast rule for all words can be laid down. The principles most frequently applicable are:

A. Divide the word according to its formation:

> know-ledge (not knowl-edge); Shake-speare (not Shakes-peare); de-scribe (not des-cribe); atmo-sphere (not atmos-phere);

B. Divide "on the vowel:"

edi-ble (not ed-ible); propo-sition; ordi-nary; espe-cial; reli-gious; oppo-nents; regu-lar; classi-fi-ca-tion (three divisions possible); deco-rative; presi-dent;

C. Divide between double letters, unless they come at the end of the simple form of the word:

Apen-nines; Cincin-nati; refer-ring; but tell-ing.

The treatment of consonants in combination is best shown from examples:

for-tune; pic-ture; presump-tuous; illus-tration; sub-stan-tial (either division); indus-try; instruc-tion; sug-ges-tion; incen-diary.

The student will do well to examine the syllable-division in a number of pages of any carefully printed book.

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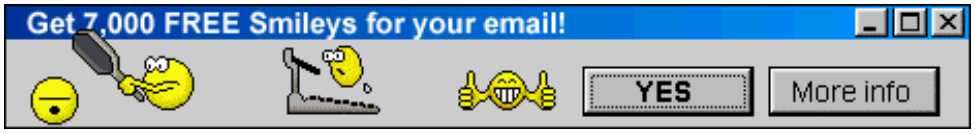

The Research Thesis: What Examiners Look For

The following is an extract of a talk given to the University of Canberra Postgraduate Students Association.

What is it that makes for an excellent thesis? What can we distil in order to send the right signals to get the outcome we want -- a good report and a pass without revision? Here is some advice, assuming of course that there is a solid kernel of a good thesis in the research you have done.

First of all, it is important to keep the thesis in the right perspective. It is not an end in itself, but rather your attempt to undertake a substantial piece of research as one further step in developing a research career. The thesis should be couched in this broader context, for it is from there that the examiners will view it. It pays to keep this in mind. Now for some specifics:

IN THE VERY BEGINNING

Does the thesis contain a succinct critical review of what is currently known so that the examiner is not left pondering as to how the work fits into the broader scheme of things? Is there sufficient background provided so that the examiner can appreciate the research problems that you are to tackle, and the objectives of the thesis?

Have the deficiencies in our current knowledge been clearly identified and the significance of addressing them been established? Do not leave the examiner thinking "Why bother?". In other words, have you identified

an interesting and manageable problem?

Has the scope of the current work been clearly articulated so as to avoid a mismatch in the examiner's expectations and what is actually delivered?

Have the research objectives been stated with sufficient precision to enable the examiner to assess whether they have been achieved or not? Is it possible NOT to achieve the objectives, and if it isn't, then the objectives are not of substance.

Do the objectives fit comfortably with (a) the critical review, do they arise from (b) the significant deficiencies in our current knowledge or understanding, and do they lie within (c) the scope of the study [as outlined above]?

Have the principal results and conclusions been stated early, usually in the abstract, so that the examiner knows where the thesis is heading from the very beginning? Do not leave the examiner in the dark.

THE WORK ITSELF

Are the materials and methods detailed enough to ensure that the work is reproducible?

Is the use of novel or non-standard methods or approaches fully justified in a way that convinces the examiner that the candidate is fully conversant with the subject?

Is the experimental design clearly articulated and appropriate to the objectives, and are the methods of statistical analysis appropriate?

Are the results unequivocal and of substance? Does the thesis make an original contribution to knowledge?

THE END GAME

Is the significance of the results fully explored in relation to the current literature, especially where the results are at odds with current understanding?

Are the substantive discussion points brought home with finality? Can the examiner see clearly what the candidate has concluded, before the thesis moves on to the next idea?

Has clear ownership of your contribution been established? Now is not the time to be modest. Say "This is the first time this has been demonstrated for any vertebrate group", if in fact that is the case.

Are all the linkages between discrete elements of the results brought together where they are relevant to substantive conclusions? The examiner is looking for a synopsis, not a summary.

Are all the conclusions and is all of the discussion clearly linked to the results or to the established results of others. Speculation outside the realms of that supported by concrete data has its place, but it should not dominate the discussion.

Have all the stated research objectives of the thesis been addressed, regardless of the outcome?

Have the avenues for future work opened up by the thesis been clearly articulated?

IN THE FINAL ANALYSIS

Has the thesis made a substantive original contribution to our knowledge and understanding?

Good luck . . . . . Arthur Georges 15/7/96

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UNIVERSITIES AND POST COMPULSORY ACADEMIC CONDITIONS AWARD 1995

1 - TITLE

This Award shall be referred to as the Universities and Post Compulsory Academic Conditions Award 1995.

2 - ARRANGEMENT

Subject matter/Clause number

3 - APPLICATION

(a)

This award shall be binding according to its terms upon:

(i) the National Tertiary Education Industry Union, hereafter known as the NTEIU, and the Australian Education Union, hereafter known as the AEU.

(ii) the institutions listed in schedule 1 of this award in relation to all members of the academic staff who are eligible to be members of an organisation listed in paragraph 3(a) (i) whether members or not;

(iii) the Australian Higher Education Industrial Association in respect of its members.

(b)

The requirements of clauses 9,11,12,13 and 21 shall have no application to any academic staff member who is a casual staff member engaged for a short period within the meaning of the Industrial Relations Regulations.

4 - PERIOD OF OPERATION

This Award shall come into operation on and from 11 May 1995, and shall continue in force for one year.

5 - DEFINITIONS

(a)

"Chief Executive Officer" means the Vice-Chancellor of the University, or where applicable, a college director, or a person acting in a Chief Executive Officer's position, or as his or her nominee.

(b)

"Termination of Employment" means termination of employment at the initiative of the employer institution.

(c)

"Disciplinary Action" means action by the institution to discipline a member of academic staff for unsatisfactory performance, misconduct or serious misconduct and is limited to:

(i) Formal censure or counselling;

(ii) Demotion by one or more classification levels or increments;

(iii) Withholding of an increment;

(iv) Suspension with or without pay;

(v) Termination of employment;

(d)

"Serious Misconduct" shall mean:

(i) Serious misbehaviour of a kind which constitutes a serious impediment to the carrying out of an academic's duties or to an academic's colleagues carrying out their duties.

(ii) Serious dereliction of the duties required of the academic office.

(iii) Conviction by a court of an offence which constitutes a serious impediment of the kind referred to in paragraph (i).

(e)

"Misconduct" shall mean conduct which is not serious misconduct but which is nonetheless conduct which is unsatisfactory.

(f)

"Act" means the Industrial Relations Act 1988 as amended.

6 - STAFF DEVELOPMENT

(a)

(i) Each institution shall, where funds are available, establish a staff development programme.

(ii) Staff development programmes should offer staff members the opportunity to develop their skills and effectiveness within the institution, and to promote improved performance and efficiency through staff development.

(b)

Staff development procedures should be compatible with the development of equal opportunity and affirmative action policies, and offer staff the opportunity for impartial appraisal of their performance and provide avenues to develop in identified areas where appropriate.

(c)

The staff development programme of most institutions will be assisted by the establishment or maintenance of an academic staff development unit with adequate staff and other resources, readily accessible to all levels of academic staff. The level of staffing and resources devoted to staff development will vary according to the size and needs of each institution.

(d)

Where academic staff development units are established they should be staffed by academic and ancillary professional staff who understand and are experienced in the processes of academic teaching, research and administration.

(e)

Academic staff development units should be involved in the implementation and supervision of staff development programmes.

(f)

Staff development programmes should include components for:

(i) new members of staff;

(ii) ongoing staff development;

(iii) training of chairs and heads of departments, schools or other equivalent academic units;

(iv) training of supervisors in staff assessment techniques;

(v) training of conciliators.

(g)

All new staff who have not previously held a teaching post should be encouraged to attend an induction programme. Teaching loads of such staff should make appropriate allowance for this.

(h)

All academic staff shall have access to a range of staff development opportunities including but not restricted to:

(i) programmes and consultative services on teaching and teaching development;

(ii) confidential services to assist in the evaluation of teaching for the purposes of improvement.

7 - ACADEMIC STAFF SUPERVISION

(a)

Each academic shall have a nominated supervisor, and shall be advised in writing of the name and position of the nominated supervisor. Academic staff may request the nomination of an alternative supervisor.

(b)

Supervisors shall provide academic and administrative leadership and are responsible for monitoring the performance of academics and for providing assistance to academics whose performance is assessed as requiring improvement. Wherever possible supervisors shall be competent in the areas of expertise of the academics for whom they are responsible.

(c)

The procedures set out in this clause are designed to provide a mechanism to assess the performance of academic staff. The primary purpose of this process is to provide assistance to any academic staff member whose performance is assessed as requiring improvement.

(d)

The supervisor shall be the head of the academic unit in which the academic is employed, provided that the Chief Executive Officer may delegate in writing another academic staff member classified at Level C or above to be supervisor of one or more academics or group of academics.

(e)

The supervisor shall within three months of being nominated, receive appropriate training in academic staff assessment techniques and the provisions of this award. Guidelines including provisions for exceptions and a timetable for supervisor training shall be negotiated between the institutional branch of the union and the institution in accordance with provisions of Clause 8.

(f)

Nothing in this award prevents an academic staff member who is head of an academic organisational unit which is not a sub-component of any larger academic organisational unit (such a unit may be called a "Faculty", "Division" or similar title) being made directly responsible to the Chief Executive Officer, in which case the terms of sub-clauses (a) to (d) of this clause shall have no application to the academic staff member.

8 - SUPERVISOR TRAINING

The institutional union branch and the Institution shall develop agreed guidelines and an agreed timetable for supervisor training which will incorporate:

(a)

Induction programs for supervisors upon appointment;

(b)

The development of an ongoing annual program of supervisor training;

(c)

Training directed towards assessment of job performance rather than individual characteristics;

(d)

Training which includes equal opportunity and affirmative action policies and guidelines;

(e)

Training on academic staff assessment techniques and the provisions of the award.

9 - TERMINATION OF EMPLOYMENT AND DISCIPLINARY ACTION

(a)

All decisions to discipline or terminate the employment of an academic must be in accordance with this clause.

(b)

Except as specifically provided herein to the contrary, the terms of this Award shall cover exhaustively the subject matter concerned, and are to the exclusion of:

(i) State and Territory law (including any written or unwritten law pursuant to which the Visitor to any employer may exercise any jurisdiction or power) in respect of any matter subject to this Award; and

(ii) any law of the Commonwealth or an internal Territory of the Commonwealth, in respect of which the Australian Industrial Relations Commission has power to make an award which is not consistent with that law by reason of section 121 of the Act (including any written or unwritten law pursuant to which the Visitor to any employer may exercise any jurisdiction or power) in respect of any matter subject to this Award to the extent that this Award is not consistent with that law.

Provided that the provisions in this Award shall be subject to and shall not affect the operation of:

(A) any law empowering a State or Commonwealth industrial tribunal to order re-instatement of or compensation to a staff member or to otherwise deal with the dismissal of that staff member;

(B) any other law empowering any court or tribunal external to an employer (other than a Visitor to that employer) which has jurisdiction to deal with any causes of action or claims arising from actions taken by an employer pursuant to this Award.

(c)

Any procedural requirements imposed by laws referred to in subclause (b) are entirely displaced and extinguished by force of this award.

(d)

An institution must not terminate the employment of an academic unless the academic has been given notice and/or compensation as required by section 170DB of the Act, provided that:

(i) the institution may terminate without notice the employment of an academic found to have engaged in conduct of a kind envisaged in section 170DB(1)(b) of the Act such that it would be unreasonable to require the employer to continue employment during a period of notice;

(ii) Greater notice and/or compensation specified in the academic's contract of employment or in the terms of the 1991 Academic Award Restructuring Agreement or in this award shall prevail over the terms of section 170DB of the Act.

(e)

This award is to be read in conjunction with Division 3 of Part VIA of the Act provided that an academic shall be entitled to the benefit of :

(i) any award clause which is more favourable to the academic than any corresponding provision in the Act;

(ii) any procedural step required by the award in addition to the required procedural steps of the Act.

(f)

Disciplinary action should be used as a last resort. An academic supervisor must make every effort to resolve instances of possible misconduct or unsatisfactory performance through guidance, counselling and appropriate academic staff development, or appropriate work allocation before a possible report to the CEO. At the request of the staff member a supervisor must consult with colleagues in the academic unit before making a formal report to the Chief Executive Officer under subclause 11(b).

(g)

Disciplinary action may only be taken by the Chief Executive officer and only in accordance with this award.

(h)

In cases involving misconduct, disciplinary action shall be limited to the scope of 5(c) (i)to (iv).

10 - PROBATIONARY EMPLOYMENT

(a)

Notwithstanding the provisions of clauses 11, 13 and 14 the Chief Executive Officer may dismiss with notice a probationary academic on the grounds of unsatisfactory performance provided that:

(i) The academic is serving a reasonable qualifying or probationary period determined and notified to the academic in advance; and

(ii) The dismissal complies with institutional probation review and appeal procedures negotiated between the institutional union branch and the institution; and

(iii) Notice of dismissal is given in writing.

(b)

An academic dismissed in accordance with subclause (a) shall be entitled to notice, compensation or procedural requirements as specified in the academic's contract of employment, the 1991 Award Restructuring Agreement or in Section 170DB of the Act whichever is the greater.

(c)

Until agreement is reached in accordance with paragraph (a)(ii) the provisions of clauses 7,11, 13 and 14 shall apply to decisions to dismiss probationary academics on the grounds of unsatisfactory performance.

11 - DISCIPLINARY ACTION FOR UNSATISFACTORY PERFORMANCE

(a)

Where a supervisor is of the view that the performance of an academic is unsatisfactory, the supervisor shall first counsel the academic on the nature of the improvement required and the time within which reasonable improvement can be expected. A record of the counsel given shall be kept and a copy supplied to the staff member concerned. If the supervisor believes it appropriate, he/she shall direct the academic to undertake a course of professional development or other appropriate program(s) designed to assist in improving performance.

(b)

Where a supervisor believes that counselling has not produced the desired improvements in performance, the supervisor shall make a formal report to the CEO that the performance of a staff member is unsatisfactory. Such a report shall state clearly the aspects of performance seen as unsatisfactory and the record of attempts to remedy the problem.

(c)

The supervisor shall provide the academic with a copy of the report at the time it is submitted. The academic shall be entitled to 10 working days to submit to the CEO a written response to the supervisors' report.

(d)

Upon receipt of the supervisors' report and any written response from the academic, the CEO shall first satisfy himself/herself that appropriate steps have been taken to bring the unsatisfactory nature of performance to the academic's attention, that an adequate opportunity to respond was given, that any response was taken into account, that a reasonable opportunity has been afforded to remedy the performance problem and that there has been appropriate consultation with the academic's colleagues by the supervisor.

(e)

The CEO may then decide to;

(i) take no further action;

(ii) refer the matter back to the supervisor to ensure that the steps referred to in subclause (d) are complied with in substance and in a manner appropriate to the circumstances;

(iii) take disciplinary action, as defined.

(f)

The CEO shall advise the academic in writing of any decision made in accordance with subclause (e) and such a decision shall take effect no earlier than 5 working days from the date of the CEO's written advice.

(g)

If within 5 working days of the written advice referred to in subclause (f) the CEO receives from the academic a written request for a review of the decision the CEO shall refer the matter to an Unsatisfactory Performance Review Committee in accordance with the provisions of Clause 13 and 14.

(h)

Nothing in this clause prevents or affects the procedures for the denial of an increment under the incremental advancement clauses of any award dealing with the terms and conditions of

employment of academic staff.

(i)

Nothing in this clause prevents the CEO on his or her own motion referring a question of possible unsatisfactory performance to a supervisor for appropriate action.

12 - DISCIPLINARY ACTION FOR MISCONDUCT/SERIOUS MISCONDUCT

(a)

Before the CEO takes disciplinary action against an academic for reasons amounting to misconduct or serious misconduct, the CEO must take the steps in this clause, except that, where a matter which may involve misconduct or serious misconduct has been dealt with in good faith as if it were a case of unsatisfactory performance under clause 11, the procedures of this clause are not required, but the provisions of clause 11, including notice periods and review procedures must be followed.

(b)

Any allegation of misconduct/serious misconduct shall be considered by the CEO. If he/she believes such allegations warrant further investigation the CEO shall:

(i) notify the academic in writing and in sufficient detail to enable the academic to understand the precise nature of the allegations, and to properly consider and respond to them;

(ii) require the academic to submit a written response within 10 working days.

(c)

At the time of notifying the academic in accordance with subclause (b) the CEO may suspend the academic on full pay, or may suspend the academic without pay if the CEO is of the view that the alleged conduct amounts to conduct of a kind envisaged in section 170DB (1)(b) of the Act such that it would be unreasonable to require the employer to continue employment during a period of notice.

Provided that:

(i) where suspension without pay occurs at a time when the academic is on paid leave of absence the staff member shall continue to receive a salary for the period of leave of absence;

(ii) the academic may engage in paid employment or draw on any recreation leave or long service leave credits for the duration of the suspension without pay;

(iii) the CEO may at any time direct that salary be paid on the ground of hardship.

(iv) where a suspension without pay has been imposed and the matter is subsequently referred to a Misconduct Investigation Committee, the CEO shall ensure that a Misconduct Investigation Committee at its first meeting determine

whether suspension without pay should continue and that committee shall have the power to revoke such a suspension from its date of effect.

(d)

If the allegations are denied by the academic and the CEO is of the view that there has been no misconduct or serious misconduct he/she shall immediately advise the staff member in writing, and may, by agreement with the academic, publish the advice in an appropriate manner.

(e)

If the allegations are admitted in full by the academic and the CEO is of the view that the conduct amounts to misconduct or serious misconduct the CEO shall advise the academic in writing of the CEO's decision and the operative date of the disciplinary action.

(f)

If the allegation is denied in part or in full or if the academic has not responded to the allegations the CEO shall refer the matter to a Misconduct Investigation Committee in accordance with the provisions of Clause 13, unless he/she decides to take no further action or counsel or censure the academic for unsatisfactory behaviour and take no other action.

(g)

During any period of suspension the academic may be excluded from the institution, provided that he or she shall be permitted reasonable access to the institution for the preparation of his or her case and to collect personal property.

(h)

Nothing in this award implies an inability to deny pay during a period of strike or lockout or where a staff member is not ready, willing and able to carry out duties.

13 - COMMITTEES

(a)

Where an academic has made a written application for a review of disciplinary action under subclause 11(g) the CEO shall convene an Unsatisfactory Performance Review Committee no later than 10 working days from the date of receipt of such a review application.

(b)

Where a matter is referred to a Misconduct Investigation Committee pursuant to subclause 12(f) the CEO shall convene the committee within 10 working days where practicable.

(c)

Where a committee is established by the CEO under subclause (a) or (b) the committee shall consist of three members one from each of the following pools of potential committee members:

(i) a pool of persons from within the institution chosen by the CEO;

(ii) a pool of persons from within the institution chosen by the institutional union branch;

(iii) a pool of chairpersons agreed between the CEO and the institutional union branch.

However the CEO shall not finalise the composition of a committee before consulting with the institutional union branch.

Where unusual circumstances exist the CEO and the institutional union branch may agree that persons other than those nominated to the pools (whether staff members or not) may be appointed to committees.

(d)

All institutions shall act as expeditiously as possible to establish appropriate pools in accordance with subclause (c) and the institutional union branch as appropriate shall extend full cooperation in the process.

(e)

Where a committee needs to be formed and appropriate pools of committee members have not yet been established, then the CEO shall confer urgently with the institutional union branch to agree on a chairperson and to exchange nominations of the other two committee members. The union shall extend full cooperation in establishing the committee.

(f)

Each of the committees established in accordance with subclause (a) or (b) shall:

(i) provide an opportunity for the academic to be interviewed by it and ensure that he/she has adequate opportunity to answer findings of unsatisfactory performance, or allegations of misconduct or serious misconduct. The committee may take into account such further materials as it believes appropriate to substantiate or otherwise the facts in dispute;

(ii) interview any person it thinks fit to establish the merits or facts of the particular case;

(iii) conduct all interviews in the presence of the academic or the academic's advocate and the CEO or his or her advocate;

(iv) allow the academic and the CEO each to be assisted or represented by an agent of his or her choice who is a staff member of the institution (but not if such a person is a currently practising solicitor or barrister,) or by an officer or staff member of the union or the AHEIA;

(v) conduct proceedings as expeditiously as possible consistent with the need for fairness;

(vi) conduct proceedings in camera (unless otherwise agreed by the union and the CEO) and as a committee of inquiry;

(vii) take into account such further material as it believes appropriate to the case;

(viii) ensure that the academic or his/her representative and the CEO or his/her representative have the right to ask questions of interviewees, and to make submissions. They also shall have the right to present and challenge evidence;

(ix) make its report available to the CEO and the staff member as soon as reasonably possible;

(x) The committee shall keep a tape record of the proceedings (but not its own deliberations), which shall be available on request to either party.

14 - UNSATISFACTORY PERFORMANCE REVIEW COMMITTEE AND SUBSEQUENT ACTION BY THE CEO

(a)

This clause shall apply where a matter has been referred to an Unsatisfactory Performance Review Committee.

(b)

The terms of reference of the Committee shall be to report on whether the process set out in clause 11 has been followed.

(c)

The committee shall provide a report to the CEO and the academic as soon as is practicable following the conclusion of committee proceedings.

(d)

If the committee concludes that the process set out in clause 11 was not properly followed, the CEO shall reconsider his/her decision but may first take such steps to remedy the perceived unfairness as may seem to him/her reasonable.

(e)

If the CEO is of the view that there has been no unsatisfactory performance he/she shall forthwith advise the staff member in writing, and may, by agreement with the academic, publish the advice in an appropriate manner.

(f)

The action of the CEO under this clause shall be final, except that nothing in this subclause shall be construed as excluding the jurisdiction of any external court or tribunal which, but for this subclause, would be competent to deal with the matter.

15 - MISCONDUCT INVESTIGATION COMMITTEE AND SUBSEQUENT ACTION BY THE CEO

(a)

This clause applies where a matter has been referred to a Misconduct Investigation Committee.

(b)

The terms of reference of the Committee are to report on the facts relating to the alleged misconduct or serious misconduct, including whether any mitigating circumstances are evident.

(c)

The committee shall provide a report to the CEO and the academic as soon as is practicable following the conclusion of committee proceedings.

(d)

On receipt of the report of the Committee, and having considered its findings on the facts related to the alleged misconduct or serious misconduct, the CEO may take disciplinary action.

(e)

If, having considered the Committee's findings on the facts relating to the alleged misconduct or serious misconduct , the CEO is of the view that there has been no misconduct or serious misconduct he/she shall immediately advise the staff member in writing, and may, by agreement

with the academic, publish the advice in an appropriate manner.

(f)

Where a staff member has been suspended without pay pending the decision of the CEO, then any lost income shall be reimbursed if there was no misconduct or serious misconduct. However, a decision taken by the Chief Executive Officer in his or her discretion not to dismiss or impose another penalty shall not be construed as an admission that there was no conduct justifying suspension without pay.

(g)

This clause in no way constrains an institution from carrying out other or further investigations relating to the consequences of conduct of a staff member or former staff member when required in the public interest, eg inquiring into the truth of research results.

(h)

All actions of the Chief Executive Officer under this clause shall be final, except that nothing in this subclause shall be construed as excluding the jurisdiction of any external court or tribunal which, but for this subclause, would be competent to deal with the matter.

16 - TERMINATION OF EMPLOYMENT ON THE GROUNDS OF ILL HEALTH

(a)

The Chief Executive Officer may require, in writing, any staff member whose capacity to perform the duties of his or her office is in doubt to undergo a medical examination by a medical practitioner chosen by the institution at the expense of the institution.

(b)

The Chief Executive Officer shall provide a staff member with written notice of not less than 2 months that a medical examination is required. Where the staff member elects to apply to the staff member's superannuation fund, prior to the expiry of the period of notice, for ill-health retirement or temporary disability benefit pursuant to the rules of the superannuation fund, the requirement for a medical examination under subclause (a) hereof shall lapse forthwith and no further action shall, subject to subclause (c) hereof, be taken by the Chief Executive Officer under this clause.

(c)

Where the superannuation fund decides that the staff member, following a period of receipt of a temporary disability benefit, is capable of resuming work and the Chief Executive Officer elects to dispute this decision, the Chief Executive Officer may proceed in accordance with this clause without further recourse to the provisions of subclause (b) hereof.

(d)

A copy of the medical report made by the medical practitioner pursuant to subclause (a) hereof shall be made available to the Chief Executive Officer and to the staff member.

(e)

If the medical examination reveals that the staff member is unable to perform his or her duties and is unlikely to be able to resume them within a reasonable period, being not less than 12 months, the Chief Executive Officer may, subject to subclause (f) hereof, terminate the employment of the staff member in accordance with the notice required by the staff member's contract of employment or where no notice is specified a period of 6 months. Prior to taking action to terminate the employment of a staff member, the Chief Executive Officer may offer the staff member the opportunity to submit a resignation and, if such a resignation is offered, shall accept it forthwith and not proceed with action to terminate employment.

(f)

If within 14 days of the report being made available, if the staff member or a person acting on their

behalf so requests, the Chief Executive Officer shall not terminate the employment of the staff member in accordance with subclause (e) hereof unless and until the findings of the report are confirmed by a panel consisting of three medical practitioners, one of whom shall be appointed by theinstitution, one by the staff member or by a person acting on his or her behalf, and one by the President of the State or Territory Branch of the Australian Medical Association. The Panel shall not include the practitioner who made the initial report.

(g)

In making an assessment as to whether or not a staff member is unable to perform his or her duties and is unlikely to be able to resume them within a reasonable period, the medical practitioner or panel of medical practitioners appointed pursuant to this clause shall as far as possible apply the same standards as are used by the staff member's superannuation scheme, if any, in determining qualification for the payment of a disablement pension or other similar benefit.

(h)

These provisions shall not displace or override any existing workers compensation schemes or awards whether State or Federal, including WorkCare and WorkCover, or the provisions contained in any workers compensation legislation that may be enacted.

(i)

A Chief Executive Officer may construe a failure by a staff member to undergo a medical examination in accordance with these procedures within 3 months of a written notification to do so as prima facie evidence that such a medical examination would have found that the staff member is unable to perform his or her duties and is unlikely to be able to resume them within 12 months, and may act accordingly; provided that such a refusal by a staff member in these circumstances shall not constitute misconduct nor lead to any greater penalty or loss of entitlements than would have resulted from an adverse medical report.

17 - TIME OF TAKING LONG SERVICE LEAVE

(a)

Subject to subclause (b) hereof, a member of staff who has qualified for long service leave shall be entitled to take long service leave at a time of his or her choosing, provided that at least six months written notice of such leave is given and, in the absence of such notice, the Chief Executive Officer consents.

(b)

Where a member of staff has accumulated a long service leave entitlement in excess of 4.5 months, the Chief Executive Officer may give the staff member written notice to take up to three months of such leave, at a time convenient to the needs of the institution, provided that:

(i) the Chief Executive Officer shall give the staff member written notice of at least twelve months of the date on which leave must commence;

(ii) the staff member shall not be required to take long service leave within 24 months of the intended date of retirement of the staff member;

(iii) the minimum period of leave the employer can require a staff member to take shall be six weeks;

(iv) in any case where a staff member has taken leave pursuant to this subclause the Chief Executive Officer shall not require the staff member to take a further

period of long service leave for a period of two years after the end of that period of leave.

(c)

The coming into operation of these provisions shall not in any way affect or alter existing procedures, practices, legislation or orders in Council of a Governor of a State with regard to Long Service Leave except to the extent that these provisions explicitly provide.

18 - OUTSIDE STUDY AND PROFESSIONAL EXPERIENCE PROGRAMMES TRANSFERABILITY OF SERVICE

(a)

This clause:

(i) applies to full-time staff, and to fractional staff at the level of lecturer and above;

(ii) does not apply to staff who are employed on a casual basis or to staff whose salaries are paid from external funds which make no provision for outside study programmes or professional experience programmes (OSP/PEP).

(b)

The recognition of service other than on a full-time basis or below lecturer or equivalent level shall be dependent upon the rules of the receiving institution.

(c)

Each institution shall recognise prior continuous paid full-time service with other Australian higher education institutions as qualifying service when considering applications for OSP/PEP under its own rules; provided that if a staff member has taken a period of time on OSP/PEP, that period shall be taken into account in the consideration.

(d)

Eligibility for recognition of service with the releasing institution shall be dependent upon continuity of employment between the releasing and receiving institutions.

(e)

If there is not more than two months between the cessation of employment with the releasing institution and commencement with the receiving institution, continuity shall be deemed not to have been broken, but the period between cessation and commencement shall not be taken into account in determining length of service for the purposes of this clause.

(f)

Recognition of longer breaks in service shall be dependent upon the rules and practices of the receiving higher education institution.

(g)

Recognition of previous service other than as provided in this clause shall continue to be a matter for individual institutions to determine.

(h)

This clause is not intended to extend eligibility to apply for OSP/PEP to any staff member who is not, at the time this clause is included in the award, eligible to apply for such leave under the rules of the institution, nor is it intended to remove eligibility to apply for OSP/PEP from any staff member who is, at the time this clause is included in the award, eligible under the rules of the institution.

19 - VOLUNTARY EARLY RETIREMENT

(a)

Offers of voluntary early retirement made to academic employees shall be on the following terms:

(i) Early retirement shall be available to all full-time or fractional continuing staff who are no less than two years away from the institution's retiring age.

(ii) Eligible staff shall be invited to apply for early retirement under the benefits of the scheme. Any staff member who wishes to do so shall apply for early retirement to the relevant authorised officer designated by the institution. The institution, through its authorised officers, shall have the discretion to decide whether or not it will approve the application having regard to the staffing needs of the institution.

(iii) The benefit payable to staff members whose application for early retirement is approved shall be a lump sum of a minimum of two weeks salary for each year of service, with a maximum payment of 52 weeks salary. This benefit will be additional to the staff member's other entitlements on retirement.

(b)

Notwithstanding subclause 16(a), an institution may offer early retirement in accordance with a scheme approved by the Commissioner of Taxation otherwise inconsistent with subclause (a) provided that:

(i) any such offer shall be with the agreement of the institutional union branch; and

(ii) any lump sum benefit shall be calculated at a minimum rate of two weeks salary for each year of service, but with no obligation upon the institution to pay beyond a maximum of 52 weeks salary.

20 - AMALGAMATION AGREEMENTS

(a)

In this clause an amalgamation agreement means an agreement between an institution and a union or unions party to this award, or a branch of such union, or unions, relating to the transfer of academic staff to another institution in any of the following circumstances:

(i) the amalgamation of two or more existing institutions of higher education to form a new institution;

(ii) the incorporation or amalgamation of all or part of an existing institution or institutions into another existing institution;

(iii) the reconstitution of an existing institution so that it attains the status of a

university or a university college.

(b)

Where any term in an amalgamation agreement entered into after 1 January 1988 is inconsistent with a term in this or any other award then, to the extent of the inconsistency the term of the award will not apply.

21 - REDUNDANCY PROVISIONS

(a)

Where an institution has decided to terminate the employment of one or more staff members for reasons of an economic, technological, structural or similar nature, including:

(i) a decrease in student demand or enrolments in any academic course or subject or combination or mix of courses or subjects conducted on one or more campuses;

(ii) a decision to cease offering or to vary the academic context of any course or subject or combination or mix of courses or subjects conducted on one or more campuses;

(iii) financial exigency within an organisational unit or cost centre; or

(iv) changes in technology or work methods.

the institution shall first inform the staff member(s) concerned and the union.

(b)

Where an institution informs a staff member(s) and the union in accordance with subclause (a) it shall also provide the following information;

(i) the terminations and the reasons for them;

(ii) the number and categories of staff members likely to be affected; and

(iii) the time when, or the period over which, the institution intends to carry out the terminations.

(c)

As soon as practicable after making the decision referred to in subclause (a) the institution shall give the union an opportunity to consult with the institution on:

(i) measures to avert the termination or avert or minimise the terminations;

(ii) measures to mitigate the adverse effects of the termination or terminations.

(d)

The measures referred to in paragraph (c) (ii) may include redeployment, voluntary early retirement in accordance with any available scheme, secondments or offers of a voluntary separation package in accordance with subclause (g).

(e)

Irrespective of any other measure which may be agreed under subclauses (c) and (d), a staff member who has been provided with information as required under subclause (a) shall be invited at that time to apply to the Chief Executive Officer within eight weeks to take voluntary separation.

(f)

Within seven days of receipt of an application to take voluntary separation, the Chief Executive Officer shall either accept the application (and notify the staff member accordingly) or notify the staff member that no further action will be taken to terminate the employment of the staff member.

(g)

Voluntary separation as referred to in subclauses (d) and (e) shall be on the basis of the following benefits:

(i) a sum calculated at the rate of 2 weeks' salary per completed year of service with the institution to a maximum entitlement of 52 weeks' salary;

(ii) payment on a pro rata basis for long service leave calculated on completed years of service;

(iii) six months' further employment from the date of acceptance of an application for voluntary separation;

(iv) in relation to the period of further employment the Chief Executive Officer shall, if the staff member requests and if the request is not impracticable in the interests of the efficient administration of the institution, waive all or part of the six month period, in which case the staff member shall receive payment for the balance or 4 weeks' pay, whichever is the lesser;

(v) all payments under this subclause shall be calculated on the staff member's salary at the date of cessation of employment; and

(vi) the benefits in this subclause are in lieu of any notice period, access to a scheme of redeployment or other redundancy benefit.

(h)

Following the consultations referred to in subclause (c) the Chief Executive Officer may formally advise in writing any staff member who has failed to apply for voluntary separation that the staff member is an excess staff member.

(i) Prior to a final decision to terminate an excess staff member's employment, an excess staff member shall be given:

(i) in the case of a staff member who is over 45 years of age 12 months further employment from the date of advice under subclause (h);

(ii) in the case of a staff member who is over 40 years of age but under 45, such further employment according to the following scale:

Age 40 - 7 months
Age 41 - 8 months
Age 42 - 9 months
Age 43 - 10 months
Age 44 - 11 months;

(iii) in the case of any other staff member further employment of six months.

Review

(j)

Where a staff member has been formally advised under subclause (h) that he or she is an excess staff member he or she may, within 7 days of such advice, lodge with the Chief Executive Officer an application for review of the decision.

(k)

Where a staff member has lodged an application for review under subclause (j) the Chief Executive Officer shall forthwith establish a committee consisting of three members as described in subclause 13(c).

(l)

The committee shall provide an opportunity for the staff member to be interviewed by it and shall give the staff member adequate opportunity to put his or her case that fair process was not observed up to the point of the decision by the Chief Executive Officer to advise the staff member that he or she is an excess staff member.

(m)

The committee shall consider:

(i) whether a genuine decision was taken by the institution that an academic position or positions should not be filled by anyone or that there was a number of staff members in a category who were surplus to the requirements of the institution;

(ii) whether fair and objective criteria were used to select staff to be identified as excess staff members; and

(iii) whether genuine and adequate consultation was entered into under subclause (b) and adequate consideration was given to measures to avert or mitigate the adverse effects of the termination.

and will conduct itself in accordance with paragraph 13(f)(ii) to (ix).

(n)

If the committee decides that fair process was not observed it shall report this fact to the Chief Executive Officer setting out its reasons, specifically identifying what failures of process had taken place.

(o)

If the Chief Executive Officer receives a report to the effect that fair process was not observed, he or she shall reconsider his or her decision in the light of the committee's report but may first take such steps to remedy the perceived unfairness as seem to him or her reasonable.

(p)

In reconsidering his/her decision the CEO shall consider:

(i) measures to avert the termination or avert or minimise the terminations;

(ii) measures to mitigate the adverse effects of the termination(s). Such measures may include redeployment, voluntary early retirements, secondments or offers of voluntary separation packages.

The CEO decision shall be final, provided nothing in this subclause shall be construed as excluding the jurisdiction of any court or tribunal which, but for this subclause, would be competent to deal with the matter.

Benefits on Retrenchment

(q)

Once the foregoing steps of this clause have been exhausted, the Chief Executive Officer may terminate the employment of an excess staff member in accordance with subclause 9(d). Such termination is referred to in this clause as "retrenchment".

(r)

On retrenchment, a staff member shall be given the notice or compensation described in subclause 9 (d) and shall, in addition, receive the following amount of severance pay in respect of a continuous period of service.

Service	Severance Pay
Up to the completion of 2 years	4 weeks pay
2 years and up to the completion of 3 years	6 weeks pay
3 years and up to the completion of 4 years	7 weeks pay
4 years and over	8 weeks pay

22 - USE OF SICK LEAVE

The periods of further employment specified in subclause 21(i) of this award shall be extended by any periods of certificated sick leave taken during such periods and taken in accordance with rules, agreements or awards governing sick leave arrangements.

23 - LETTER OF CERTIFICATION

(a)

An 'excess' staff member may request a letter signed by the Chief Executive Officer certifying that he or she is the occupant of a position deemed to be surplus to the requirements of the institution.

(b)

A staff member who applies for a position in an academic institution which is a party to this award may notify that institution that he or she is a holder of such a letter of certification. In such a case the institution shall ensure that the selection committee concerned is aware of the letter of certification.

24 - LEAVE, EXPENSES AND MAINTENANCE OF SALARY

(a)

From the time a staff member receives notice under clause 21 of this award that he or she is an `excess' staff member, he or she shall be entitled to reasonable leave as determined by the Chief Executive Officer with full pay to attend necessary employment interviews. Where expenses to attend such interviews are not met by the prospective employer the staff member shall be entitled to reasonable travel and other incidental expenses incurred in attending such interviews as determined by the Chief Executive Officer.

(b)

If a staff member is redeployed to a permanent position elsewhere in the institution (ie. involving a geographic relocation) as an agreed measure to mitigate the effects of his/her position being surplus to requirements pursuant to paragraph 21(c)(ii) and, as a consequence, it is not reasonably practicable for the staff member to remain in his or her existing residence, the staff member shall be entitled to all reasonable expenses associated with moving household to a new locality on the basis set out in schedule II of this award.

(c)

Any reasonable costs and charges as determined by the Chief Executive Officer associated with a programme of retraining as an agreed measure to mitigate the effects of his/her position being surplus shall be reimbursed to the staff member.

(d)

Where, as an agreed measure to mitigate the effects of a staff member's position being surplus to requirements, the staff member is redeployed to a lower level position, placed on a programme of retraining or otherwise maintains an employment relationship with the institution but in circumstances which would provide a reduced income, normal salary shall be maintained during the arrangement for the period described in clause 21(i); however, where the employment is ultimately terminated, the periods described in this subclause and in subclause 21(i) are not cumulative.

25 - LEAVE RESERVED

Leave is reserved to the parties or any of them to apply to vary any of the terms of this award.

SCHEDULE 1-LIST OF RESPONDENTS

- Australian Higher Education Industrial Association
- Australian Catholic University
- Australian Maritime College
- Australian National University

- Central Queensland University
- Charles Sturt University
- Curtin University of Technology
- Deakin University
- Edith Cowan University
- Flinders University of South Australia
- Griffith University
- Hawthorn Institute of Education Ltd.
- James Cook University
- La Trobe University
- Macquarie University
- Monash University
- Murdoch University
- Northern Territory University
- Queensland University of Technology
- Royal Melbourne Institute of Technology
- Southern Cross University
- Swinburne University of Technology
- University of Adelaide
- University of Ballarat
- University of Canberra
- University of Melbourne
- University of New England
- University of New South Wales
- University of Newcastle
- University of Queensland
- University of South Australia
- University of Southern Queensland
- University of Sydney
- University of Tasmania
- University of Technology, Sydney
- University of Western Australia
- University of Western Sydney
- University of Wollongong
- Victorian College of Agriculture and Horticulture
- Victorian College of the Arts
- Victoria University of Technology

SCHEDULE II

1 - DEFINITIONS

For the purposes of this schedule "prescribed expenses" means:

(i) legal fees;

(ii) agent's commission;

(iii) stamp duty;

(iv) fees associated with the transfer of title;

(v) expenses relating to the execution or discharge of a first mortgage; and

(vi) any reasonable costs as determined by the Chief Executive Officer of advertising for sale of a dwelling-house.

2 - PAYMENTS

(a)

The Chief Executive Officer may authorise the payment to the employee of the reasonable costs incurred in the conveyance of himself or herself and his or her dependents, including reasonable costs for removal of furniture and personal effects.

(b)

The Chief Executive Officer may authorise the payment to the employee of an allowance comprising two-thirds of the expenses necessarily incurred by the employee in residing at a hotel or boarding-house while waiting to:

(i) commence or continue his or her journey to the new locality; or

(ii) secure a place of residence in that locality.

(c)

Subject to subclause (d) hereof, an allowance under subclause (b) hereof, shall not be paid in respect of a period exceeding:

(i) 1 week in case to which paragraph (b)(i) hereof applies; or

(ii) 4 weeks in any other case.

(d)

Where the Chief Executive Officer is satisfied that an employee to whom subclause (b) hereof applies is unable to secure a place of residence in the new locality after having made all reasonable efforts to do so, the chief executive officer may extend the period in respect of which an allowance under that subclause would otherwise be payable to that employee for such further period, not exceeding 4 weeks, as the Chief Executive Officer may determine.

(e)

Where the Chief Executive Officer is satisfied that in the circumstances of a particular case it is just and equitable to do so, he or she may authorise the payment to an employee to whom subclause (b) hereof applies of an allowance at a rate per week determined by the Chief Executive Officer for a period not exceeding 5 weeks after the expiration of the periods referred to in subclauses (c) and (d) hereof.

(f)

The Chief Executive Officer may authorise the payment to an employee to whom subclause (b) hereof applies of such amount as the Chief Executive Officer may in a particular case determine

for the purpose of compensating that employee for expenses necessarily incurred by him or her in respect of:

(i) the storage of his or her furniture and effects while waiting to secure a place of residence in the new locality; and

(ii) the cartage of the furniture and effects from the place of storage to the employee's place of residence in that locality.

(g)

An employee who is entitled to receive the expenses and allowances payable under this schedule is also entitled to be paid an incidentals allowance to compensate the employee for:

(i) the value of the increased depreciation of, and the additional wear and tear on, the basic household furniture and effects resulting from the transfer; and

(ii) the cost of the replacement or alteration of carpets, linoleum, curtains, blinds, and household effects necessitated by the transfer;

(iii) incidental costs associated with establishing a new place of residence (eg telephone, gas reconnection).

(h)

The depreciation allowance payable under this schedule is such an amount as may be determined by the Chief Executive Officer.

(i)

An employee who is entitled to receive expenses and allowances under this schedule is, subject to subclause (m) hereof, also entitled to receive a property allowance for reimbursement of prescribed expenses incurred by him or her;

(i) in the sale of the dwelling house:

1. owned and occupied by him or her;

2. which he or she was purchasing under a contract of sale providing for vacant possession; or

3. which he or she was constructing for his or her own permanent occupation, on completion of construction, at the date on which it became necessary to move to the new locality;

(i) in the purchase of a dwelling-house, or land for the purpose of erecting a dwelling-house on the land, for his or her own permanent location permanent occupation in the new locality; or

(ii) both in the sale of the dwelling-house referred to in paragraph (i) hereof and in

the purchase of a dwelling-house or land referred to in paragraph (ii) hereof.

(j)

The property allowance payable under this clause in respect of a sale, purchase, or sale and purchase, is, subject to subclause (k) hereof, an amount which is equal to the actual expenses incurred.

(k)

Where an employee is the owner jointly or in common with another person not being a person referred to in subclause (n) hereof, the property allowance payable under this clause shall not exceed an amount which is equal to the proportion of the prescribed expenses for which he or she is responsible.

(l)

An application by an employee for a property or an incidentals allowance under this schedule shall be accompanied by sufficient evidence of the payment by the employee of the prescribed expenses.

(m)

Except on the decision of the Chief Executive Officer, an employee is not entitled to the payment of a property allowance in respect of:

(i) a sale referred to in paragraph (i)(i) hereof; or

(ii) a purchase referred to in paragraph (i)(ii) hereof which is effected:

(1) more that 2 years after the date on which the employee takes up duty in new locality; or

(2) after the date on which he or she receives notification that he or she is being transferred back to the old locality.

(n)

For the purpose of this clause, it is immaterial that the dwelling-house or land is purchased, sold or owned;

(i) in the case of a married employee, solely or jointly or in common with:

(1) the spouse of that employee;

(2) a dependant of that employee; or

(3) the spouse and a dependant of that employee; or

(ii) in the case of any other employee, solely or jointly or in common with a dependant.

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Preparing a Grant Application

Applying for a grant is a time consuming process. The central idea must be formulated, articulated and refined. Consultation with peers is often required, and the implementation of the idea must be fully thought out and costed. A little politicking may be necessary, and in some cases approval must be sought from the host institution before the application can be submitted. Do not underestimate the lead time required to properly prepare a grant proposal.

Some people will tell you that applying for grants is like the lottery. You win some, you lose some. You will hear stories of people labouring for weeks over a proposal, only to have it rejected, while the proposal they knocked up in a few days delivers the goods. Even if the lottery mentality is true, your objective in dedicating time to proposal writing is to maximize the probability of success.

Other benefits flow from the effort put into preparing the grant application. Grant writing yields a well considered and externally evaluated plan for your future work. It is a requirement that commits you to the planning process, even though your commitment to the letter of the plan may change in time. The effort expended on planning the initial proposal will pay back many times over during execution of the research.

Here is some advice that may increase your success rate in securing the necessary funding for your research.

Formulate a Novel Idea

Decide early whether you have or can formulate a project with a good chance of success -- you need to come up with a good and saleable idea that fits within the broad scope outlined by the granting body. The Australian Research Council advise that to be successful in a competitive atmosphere, where the difference between "just funded" and "just not funded" is slight, it is necessary to generate novel ideas of general importance and interest, and to design exciting approaches to evaluating their success.

Without a good idea, properly articulated and within the scope outlined by the granting body, the proposal will almost certainly fail.

Involve Others in Refining the Idea

Assuming that you are in an active and collegeate research environment, you should meet and refine the idea. Brainstorm. Do not let the urge to get started with writing interfre with the overall planning and development of the central idea. Be responsive to alternate points of view and criticisms -- try not to let defensiveness block the input of good suggestions. Where appropriate, circulate and discuss the proposal in a braoder group -- start with sympathetic colleagues, but then move on to more critical peers.

Read the Guidelines Thoroughly

It is essential that your proposal falls within the bounds of what the granting body is willing to fund. You need to read the guidelines to gain an appreciation of the general aspects of the grants scheme -- how it came about, in what political context, what are the scope and objectives of the scheme, what sort of proposals is the granting body expecting.

Analyse the Selection Criteria

Go through the selection criteria and highlight key statements. Tease out a list of statements, each containing a single idea so that they can be later addressed individually.

Recognise that selection criteria are not always explicitly stated under the heading *Selection Criteria*, a section which sometimes serves principally as a guide to structuring the application. Go through the entire guidelines and highlight any statement relevant to the selection committee's perceptions of a successful application.

Recognize that selection committees often have hidden selection criteria -- I am not sure why this comes about, but I suspect it is because of the difficulties of formulating selection criteria in the absence of knowledge of the field of applicants, or it may be that the commitee wishes subconciously to retain flexibility in its decisions. New Scientist (November 13, 1993) acknowledges that there are typically two types of applicant -- those with and those without contacts in the granting body. The former group receives additional information on the selection process and criteria that will be applied in practice.

If you do not have such contacts, you can partially overcome the deficiency by obtaining documents outlining feedback given to institutions or individual applicants on previous rounds. Obtain written statements or attend talks given by the committee chairperson. Check to see if the guidelines have changed since last year. If they have, it is for a reason, and the regions of the document changed may provide insight into the committee's priorities.

Address the Selection Criteria

Brainstorm with other members of the team on how the proposed project meets, and can be improved to meet the selection criteria. Focus on outcomes, because these are usually more concrete and measurable. You will be surprised what a group of people can come up with on points of strength of a proposal with respect to the selection criteria.

Write the Application

Carefully structure the application so that its performance can be clearly gauged against the selection criteria. Follow strictly the guidelins on format and structure provided by the granting body. Remember, the committee may have hundreds of applications to consider and a quick assessment of whether your proposal gets by the first cut, usually based on a spreadsheet of applications versus selection criteria, is all that you can expect. Make the assessment as painless as possible for the selection panel. Be sure to use a copy of the application form, so as not to neglect some key piece of information.

Circulate the draft for comment by central players and, if possible, one or two applicants who were successful in previous rounds.

Redraft the application and put the draft aside for a couple of weeks.

Mock Assessment

Stand back from the application. Put yourself in the position of the selection committee.

- Is the application free of specialist jargon, and readily understandable by a non-expert committee -- know your audience. If there is a general panel and an expert panel, this task is made all that more difficult -- you must address the information requirements of both without losing the comprehension of either.
- How does the application perform against the selection criteria, both explicit and implicit?
- What are the weaknesses of the application, and have they been addressed to minimize their impact on the likely success of the application?
- Does the application exude vitality and energy? Can it be seen from the style and tone of the application that the proponents are fully committed to and excited by the prospects of undertaking the project? Has the work started? A start on the project is a good indication of committment.
- Is the budget fully justified and are all items listed acceptable to the granting body? It is not sufficient to justify an item by indicating its cost. You must demonstrate how the item is essential to satisfactory progress in meeting the project objectives.

Additional Considerations

Are there any general statements by government that indicate the importance of the broad field of endeavour in government thinking? Are there any statements made by your host institution that establish the importance of the boad field of endeavour in the institution's plans and directions, and the institution's committment to support research of the kind proposed?

Submission

Redraft and submit the proposal.

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